Valuing copper access

BT's response to
Ofcom consultation document
published December 2004

11th February 2005

Annexes to main response

This document includes the following three separate documents referred to in BT's main response:

Annex 1: Report from KPMG

Annex 2: Letter from Sir Bryan Carsberg

Annex 3: Expert Opinion by Eileen Marshall CBE

KPMG

British Telecom

Valuing Copper Access: An assessment of the Ofcom consultation paper

Final report

February 2005
This report contains 42 pages
Valuing Copper Access

Contents

1 Executive summary

Ofcom's consultation document "Valuing copper access: A consultation on principles" (hereafter "the paper") was issued on 9th December 2004. The paper argues that large-scale competition to BT's access network has not, and will not, develop. Ofcom therefore considers it necessary to form a view of the value of BT's copper access network assets[1]. To achieve this Ofcom wish to re-value BT's access asset base.

A number of options are proposed for this revaluation, using different variations on a Modern Equivalent Asset (MEA) approach, which Ofcom hypothesise is likely to lead to a downward revaluation. Ofcom also suggest that there was a potential windfall gain to BT following the conversion of BT's regulatory accounts from Historical Cost Accounting (HCA) to Current Cost Accounting (CCA) in 1997 and that this could potentially be the subject of a 'clawback' of some nature.

The Ofcom paper "is concerned very much with principles rather than specific cost numbers as it is important to develop an appropriate theoretical framework before assessing the impact of any potential change". Therefore our response to the paper reflects our concerns with principles rather than on detailed cost numbers.

At the heart of Ofcom's proposal lies a simple principle – to determine at what cost an Efficient New Entrant (ENE) could build a network of similar size, reach and functionality to BT's current network. This cost can then be combined with a fair return to provide a basis for pricing the network as an efficient network operator would. In order to achieve this, Ofcom needs to answer the key question "what costs would an efficient operator incur in efficiently building an optimally designed network." It is these costs that should be used to set regulatory prices

KPMG agree that an MEA approach represents the most robust theoretical framework for valuation of the UK local copper access network. We believe CCA (particularly the MEA variant) provides appropriate market signals since it reflects the costs an ENE, with an optimally designed network, would incur in rebuilding the access network and provides a firm foundation for regulatory pricing.

Ofcom has proposed three main options for calculating the value of an ENE access network. Options 2 & 3 require Ofcom to determine the optimal deployment of an ENE network. We believe it is not possible for Ofcom to determine this deployment as it requires the ENE to have perfect foresight into future demand and technology trends.

An ENE which decided to rollout a network would do so without perfect information and could only optimally define and efficiently deploy a network under conditions *as they find them.* To apply this concept retrospectively is to assume perfect foresight, and understates the true costs an ENE would incur.

Option 1 inherently assumes that an ENE would have built a network broadly similar to BT's existing network. It therefore accepts that any ENE would have faced the same lack of information on future demand and technology trends as BT has encountered in the past.

[1] Ofcom consultation document, Valuing Copper Access, Dec 2004, paragraph 1.3

We would agree that if BT has been grossly inefficient in building its network in the past, these costs should be borne by BT and its shareholders. Again, if BT, through poor planning or management decisions has designed a sub-optimal network these costs should also be borne by BT. Thus Ofcom must determine what network an efficient operator would have built if it was in possession of the same data – in terms of technology and customer demand - that has been available to BT. However, the approach adopted by Ofcom does not recognise that decisions made over how the network was developed appear to have been well founded on the information and technology available and were optimal at the time. Ofcom's approach requires BT to have had perfect foresight, something that is not available to any operator however efficient.

Ofcom's modelling approach to options 2 & 3, which is based on one adopted in Germany, requires a range of simplifying assumptions, i.e. assumptions are made in relation to network architecture, technology choice and what the network carries. The rationale for these assumptions is simply to allow Ofcom and its consultants to more easily model the costs of an ENE, but in doing so they avoid many real world issues. This trade-off between reliability and practicality is difficult to achieve. Ofcom's proposed approach is to attempt to model an optimal and efficient network. This must pose the question as to whether the regulator or its consultants are in a position to design a better, more cost effective network than BT engineers. We believe it may not be practically possible for any theoretical model to accurately determine what an optimal network design should be.

The valuation under options 2 & 3 must also reflect the value of cash foregone by the new entrant during the period of network rollout. This conceptual issue is related to the lack of any allowance for time in the approach proposed by Ofcom. The paper assumes the ENE is able, in effect, to develop a network instantaneously. In reality, the rollout of a new access network would take a number of years. The new entrant will therefore forego cash during the period of network rollout. It is critical that Options 2 & 3 reflect this cost. We suggest Deprival Theory[2] as a useful framework for estimating this cost.

In addition, it is critical that a valuation consider all appropriate assets required by an ENE and hence the full costs that would be incurred. Ofcom's proposed approaches do not fully take into account all the assets required by an ENE. BT's Regulatory Accounts do not provide a complete definition of assets required and thus costs incurred by the ENE. In particular, they do not include drop wires, nor assets which are fully depreciated in the Statutory Accounts - but still contribute to the economic value of the business. We initially estimate the Gross Replacement Costs (GRC) of these assets to be of the order of £4bn.

The above leads us to conclude that a revaluation based on BT's current network design and including all network assets is the most pragmatic way forward.

The valuation should only be applied to the minority of regions and services where large scale local access competition is unlikely to develop in the foreseeable future. In many major

[2] Simply put, Deprival Theory seeks to encompass opportunity cost within GRC by posing the question: "What should BT pay to avoid deprival of the relevant assets while a replacement is deployed?" i.e. the Present Value of cash foregone during the period of network deployment.

metropolitan areas effective local access competition already exists; fully half (51%) of all UK households now have cable telephony coverage. Through the 'chain of substitution', consumers and businesses across the UK enjoy many of the dynamic gains of such competition, such as low prices and high customer satisfaction. We see little evidence of significant consumer detriment. In addition, we note that emerging technologies offer the potential for superior cost economics for the delivery of services to rural areas, reducing further the boundaries of the natural regional monopoly. The outcome of this consultation could undermine the prospects for these emerging technologies.

These facts suggest that whilst in many rural areas, the access network may be a natural monopoly, it would be inappropriate to consider all urban areas in this manner. As such, the 'national natural monopoly' model proposed by Ofcom appears inappropriate and we would recommend that an approach be adopted based upon different regulatory treatments across geographical areas, and across different products.

Understating the value of the local copper access network could have serious implications for investment in next generation access networks and the competitiveness of the UK economy. Ofcom hypothesise that the impact of the consultation is likely to be a downward revaluation of the local copper access network. This would lead to reduced prices but would also effectively prevent new competitors from entering the market. Ofcom's view that large-scale access competition would never happen, would then, in effect, become a self fulfilling prophecy. The consequence for investment in next generation access networks and the UK in terms of international competitiveness may be severe.

We believe that regulatory pricing should be set with reference to forward looking costs. However, Ofcom have introduced the concept of holding losses and windfall gains, and below we provide a commentary on some of the issues this raises.

The implication of the holding loss is to allow BT to continue to obtain the same net present values from existing investments, over their lifetime, in the access network. The Ofcom paper does, however, briefly debate whether this regulatory accounting entry would be fully provided. There are, however, still particular issues remaining:

- Inaccurate revaluation may disincentivise BT from making future investment. The impact on future investment may be negative. Whilst Ofcom are silent on this issue, in order to be consistent with the approach adopted within the paper, any new additions to the network would have to be treated at the value applied to the ENE and possibly that such additions would need to be agreed with Ofcom. As such, BT may achieve a better return from investing in other assets rather than building new access networks within the UK (or upgrading the existing network with new technology). The implication for the UK is that the rollout of broadband could be delayed;

- Wrong make or buy signals would be sent to the market. The nature of these signals would depend on whether the ENE estimate of the value of the BT network – which appears arbitrary – was under or over valued. KPMG believe that the dangers of undervaluation are greater as the market would correct for any overvaluation; and

- There would still be adverse financial consequences for BT due to issues such as the rate of return, capital structure and regulatory risk.

Finally, Ofcom propose to use any 'windfall' gain arising from the switch to CCA from HCA in 1997 to offset any holding losses created by a downward valuation of the copper access network. Ofcom suggest that the windfall will be calculated as the difference between "the returns that were earned under the CCA convention to those which would have been earned had the HCA convention been retained"[3]. Ofcom are right in their assertion that a windfall gain would result from a switch, after the first period, from a HCA basis to a CCA basis if the assets continually appreciated over time. However, further analysis suggests that these results depend on the movement of asset appreciation / depreciation before the switch was made. Further we would note that the calculation method presented by Ofcom, which concentrates on particular asset classes, needs to be widened to look at the whole set of assets from which revenues are generated, i.e. BT do not earn a return on copper and duct only and Ofcom would need to consider all the assets involved in being able to sell the end product. Clearly it is important that Ofcom consider these points in detail and accept that a consistent treatment must be imposed irrespective of the direction of the windfall.

KPMG cannot support the retrospective regulation represented by the clawback approach under any circumstances. We believe that the clawback approach:

- Ignores the forward looking nature of the regulatory contract;

- Chooses to re-examine this issue and ignore other previous regulatory judgements;

- Is likely to increase the effective cost of capital (through increased regulatory risk and uncertainty) for BT, the sector and, possibly, all other regulated utilities in the UK; and

- Reduces the incentives and likelihood for BT to make future investments as any gains made are potentially always under threat of retrospective regulatory action.

In conclusion, KPMG support Ofcom's in attempts to re-value BT's local access network. This needs to be done to ensure an appropriate price is set for use of these assets. However:

1 The valuation must be fair and accurate, as a unreliable valuation may have a detrimental impact on the UK economy;

2 The valuation must assess the true costs that would be incurred by an ENE. It must reflect the time cost of money and all assets required by an ENE;

3 The valuation must be robust and reliably reflect the real, as opposed to theoretical, costs of building an ENE network;

4 The modelling approach should be based on real network constraints rather than a non existent optimised network that assumes perfect information on current and future demand and technology;

[3] Ofcom consultation document, Valuing Copper Access, Dec 2004, paragraph 7.13

5 The regulatory approach from Ofcom should be fully consistent application of the FCM model;

6 The approach should not distort investment decisions by any current and future market participants; and

7 The approach should only be applied in areas where competition is not sufficiently established.

KPMG therefore recommend that Ofcom proceed with a full and fair valuation of the full costs to an ENE of replicating BT's local access assets in areas where there is the potential for an enduring bottleneck. This requires that all assets are included at net replacement cost. The most practical way of achieving this is an Option 1-type approach. This has the considerable benefit of not requiring arbitrary and simplifying assumptions to determine theoretically optimal networks whilst allowing the regulator to set a price control regime that, if necessary, will incentivise both BT and other operators to make rational investment decisions. Whilst we recognise the theoretical attractiveness of Options 2 & 3, we do not believe it is possible to create a sufficiently reliable valuation for use in setting regulated prices.

2 Introduction

Ofcom issued a consultation document titled "Valuing copper access: A consultation on principles" (hereafter "the paper") on 9 December 2004.

Ofcom's paper argues that competition to the access network of British Telecom (BT) has not, and will not, develop. As a result, Ofcom focus on the development of a 'correct' manner of valuing the network, raising the potential for a reduced access price. A number of options are proposed for this revaluation, using different variations on a Modern Equivalent Asset (MEA) approach. Ofcom also suggest that there was a potential windfall gain to BT following the conversion of BT's regulatory accounts from Historic Cost Accounting (HCA) to Current Cost Accounting (CCA) in 1997 and that this could potentially be the subject of a 'clawback' of some nature.

In response to the paper BT has:

- Directly responded to the consultation paper; and
- Commissioned KPMG to provide a third party analysis of the key issues presented.

Ofcom's paper states it "is concerned very much with principles rather than specific cost numbers as it is important to develop an appropriate theoretical framework before assessing the impact of any potential change"[4]. This report addresses principal issues of Ofcom's proposed approach and provides an analysis of the key framework and assumptions made within the paper.

2.1 Structure of this document

This report is structured as follows:

- Section 3 debates Ofcom's initial tenet of the paper, that competition does not currently exist for BT's access network and that there is limited potential of this developing in future years;
- Section 4 analyses the approaches proposed by Ofcom to revalue the access network; and
- Section 5 considers the issue of potential windfall gains following the conversion of BT's regulatory accounts from HCA to CCA in 1997 and Ofcom's proposal that any such gains may potentially be the subject of a 'clawback'.

[4] Ofcom consultation document, Valuing Copper Access, Dec 2004, paragraph 2.6

3 Could large-scale local access competition develop in the foreseeable future?

3.1 Ofcom position

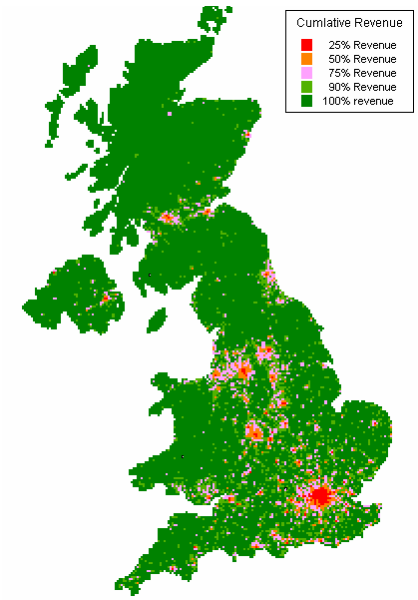
Ofcom contend that unsatisfactory industry conditions constitute a compelling and timely reason to reconsider the principles underpinning the valuation of BT's local copper access network. More specifically, Ofcom contend that "large-scale local access competition in the UK is unlikely in the foreseeable future" and that, as a consequence, "it may be then that greater priority should be given to the need to protect consumers from excessive pricing".

The Ofcom paper is predicated on this assumption of a national natural monopoly. If this argument is overstated, much of the proposed remedy is disproportionate. However we contend that durable competition has taken hold and is delivering real benefits to consumers.

3.2 The current state of local access competition in the UK

The following figure maps the density of BT's Public Switched Telephony Network (PSTN) and Leased Line revenues and shows that a very large portion of BT's revenue is confined to a small number of metropolitan centres[5]:

Figure 3.1: The geographic distribution of BT's revenue



Source: BT [6]

[5] The UK has a high proportion of its population in conurbations of 100,000 or greater of nearly 60%, which is twice both the EU and the US average (Source: Geo Hive Global Statistics).

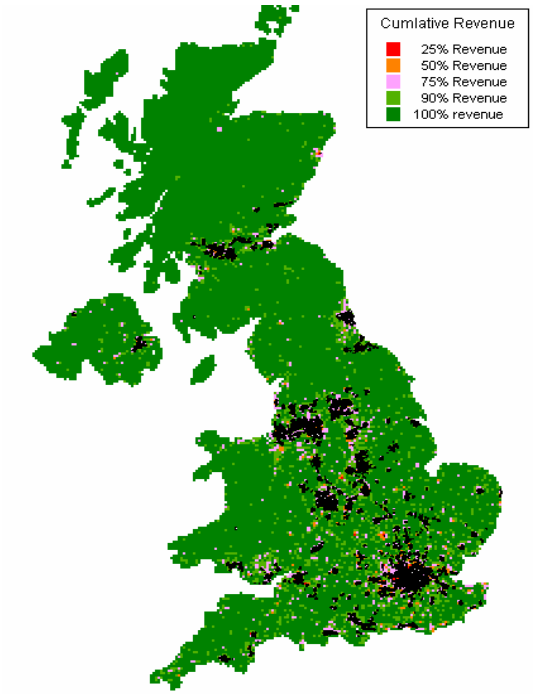
[6] *http://www.btplc.com/Thegroup/Regulatoryinformation/Consultativeresponses/Oftelmarketreviews/2003/Fixednarrowbandretail/annexes.pdf, page 22, section A7*

In particular, we note that:

- 25% of this total revenue comes from 0.6% of the surface area of the UK;
- 50% is provided by under 3% of the surface area; and
- 75% of total revenue comes from under 8% of the UK's surface area.

Competitive entry has focused on these areas - no competitor to BT provides infrastructure in rural areas except on a bespoke, self-financing basis. Figure 3.2 shows that the networks of BT's biggest competitors – the cable companies - are concentrated in those areas of high revenue density.

Figure3.2: Cable access networks relative to BT's revenue



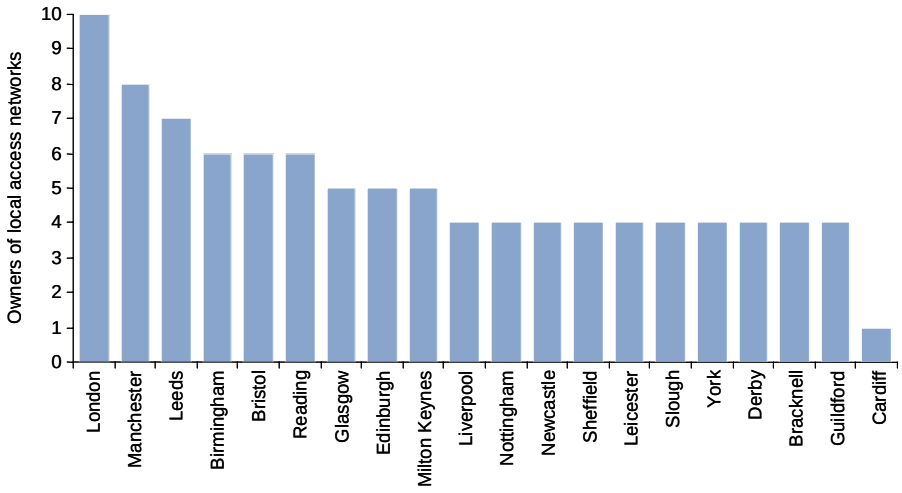
Note - Cable areas superimposed in black.

Source: BT[7]

This supply competition is augmented by other alternative network operators (Altnets) who have built local access networks in key business districts to target larger businesses.

[7] This geographically focused competition delivers durable local access competition to 13.1m or 51% of all UK households and around 40% of UK businesses. According to the cable operators, One third of households in cable franchise areas (4.3m) subscribe to cable telephone services.

Figure 3.3: Competitive intensity in 20 key metropolitan areas



Source: Operators, KPMG analysis

KPMG have identified nine major suppliers of local access network in the UK (C&W, Energis, Kingston, MCI, Thus, Fibrenet COLT, Global Crossing). Altnets such as THUS Group plc estimate that their 106 Points of Presence (POPs) and 15 Metropolitan Area Networks (MANs) and local access network in 15 key business districts give them coverage of 61% of medium and large businesses in the UK, whereas Fibrenet claim 95% coverage of all UK businesses. These figures will overlap somewhat with Cable's 40% coverage of UK businesses, but does suggest that the majority of UK business premises have the choice of at least two local access providers.

The conclusion is that while competition for both residential and business customers is strong in some areas, it shows significant local variation. Furthermore, whilst business customers (seeking higher bandwidth, multi-lined and data services) enjoy wider competition, residential customers (predominantly seeking lower bandwidth, single line and limited data services) currently enjoy a more limited choice of providers.

Further, Ofcom has presented little evidence to show that prices are too high in the UK. Indeed, Ofcom's latest benchmarking study shows that prices for residential fixed telecoms services in the UK are lower than in France, Germany, and the USA. Ofcom suggest that "[price declines] may appear to indicate a move to more cost-reflective pricing"[8].

This suggests that Ofcom's view that large scale local access competition is unlikely may be at best limited to a small part of the UK market. We therefore conclude that in many metropolitan access markets, the majority of consumers have real local access alternatives to BT. The extent and depth of competition depends upon the customers demand for bandwidth and the area in which they are located. We therefore challenge Ofcoms basic premise that the entire UK market is currently a natural monopoly.

[8] The Communications Market 2004, Ofcom, August 2004, page 33.

3.3 The impact of technological developments on local access competition

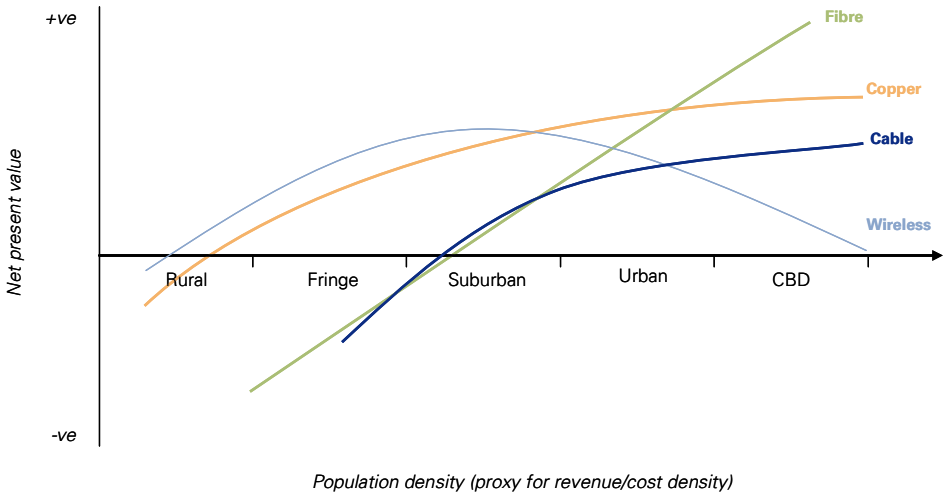
3.3.1 The relationship between technology and availability of local access competition

The construction cost of local access infrastructure is driven largely by the distance from the Local Exchange and on the number of end-users in a given area. The cost per customer falls as the number of customers increase in a given area. The potential market revenue depends on the number of customers who can be served with the access infrastructure and the scale of their telecommunications needs. As a result, the attractiveness of a location for the provision of access infrastructure services depends on the geographic density of available customer revenue[9].

Attractiveness can be measured by the Net Present Value (NPV) available to a supplier. The shape of the NPV curve also varies by technology. The following figure considers the likely shape of the NPV curves for various population densities and technologies. It suggests that the boundary of this natural monopoly region recedes, i.e. moves to the left, as alternative technologies, particularly cellular and wireless, offer increasingly attractive economics, and push the breakeven point of the curve to the left. If correct, this figure suggests that a natural monopoly may exist only in rural or fringe areas.

The chart below plots NPV as a function of population density. Value itself is driven by both costs and revenues. We accept these functions will depend on other variables such as the price of services being carried over the access network. It is quite possible that the shape of the curves presented would change if the NPV were to be considered for different bandwidth and technologies e.g. voice and data, and for different types of customer e.g. residential and business. However although revenues may vary considerably, each service will exhibit a large degree of shared costs.

Figure 3.4: Illustrative NPV curves for various access technologies



Source: KPMG

[9] Strictly speaking, attractiveness is a function of cost and revenue density in a given area. We consider population density to be a reasonable proxy.

We accept that Figure 3.4 is conceptual at this stage. However it provides a useful tool to analyse where competition might exist in the future.

Advances in technology which reduce costs promise to push these curves yet further to the left, reducing the boundaries of the natural monopoly region. Wireless is perhaps the most prominent example.

3.3.2 Developments in wireless technology and the implications for local access competition

Wireless technologies, such as Wi-Max (including MMDS and other fixed wireless technologies) may also offer attractive economics for delivery of telecom services in fringe or rural areas. As the footprint of technology grows and its costs drop even further, it could compete with DSL in rural areas, where it will be in the early stages of its fixed-cost amortization curves.

These and other developments (e.g. 3G/4G cellular) are capable of blurring the currently accepted distinction between fixed and mobile voice services. This development would be to the benefit of consumers in the form of increased choice, faster innovation and lower prices. We believe it is appropriate for a regulator to create a bias towards investment in these and other alternative technologies and to reflect these developments in future market reviews.

3.4 Conclusions

- KPMG conclude that Ofcom's fundamental premise that the entire UK market for local access is a natural monopoly is incorrect.

- The extent of choice available depends upon the location of the customer and his/her bandwidth requirements. Customers located in high population areas with high bandwidth service requirements enjoy the greatest choice.

- Ofcom's pricing, based on any revaluation of the access network, should only be applied to the location and service where natural monopoly conditions are likely to continue to exist.

- Future technology developments are likely to reduce the extent of any existing natural monopoly.

- It is therefore appropriate to consider the potential boundaries of a de-averaged approach to market definition and regulation.

- Ofcom's statement that "large-scale local access competition is unlikely" could itself become a 'self-fulfilling prophecy' if the proposed remedy understates true costs, and in doing so reduces or removes the incentive for BT or other Telecom Network Operators to make new investments in local access networks.

4 Revaluing BT's access network

4.1 Introduction

This section reviews Ofcom's proposals for revaluing BT's access network. In particular we consider:

- The theoretical basis for Ofcom's approach to calculating the costs of an efficient new entrant;
- Ofcom's proposal in more detail;
- The implications of any potential downward revaluation on BT; and
- The experience of applying similar approaches in other countries and industries.

4.2 Regulatory price setting and asset valuation

The economic value of a business is determined by the current value of the future cash-flows. Revenues are determined by demand for the goods or services produced by the business and the price at which they are sold. Costs are determined by the purchase price of its assets and the cost of operating them. In a competitive market, prices are set by the market. In a regulated industry, the price of a firm's output is determined by the regulator. The value of a regulated business' assets is therefore influenced by the regulator through the control of prices.

In an effectively competitive market, prices are driven down to the cost that an efficient new entrant charges for the service. The economic value of a business' assets is therefore determined by the costs that a new entrant incurs in producing the service. In the absence of effective competition, one of the objectives of the regulator is to ensure that economic efficiency is achieved and consumers are protected. This is typically done by setting regulated prices on the basis of the cost that a new entrant would incur in delivering the service.

It is important to note that the economic value of a regulated business' assets is influenced by the regulated price and not vice-versa. Ofcom's objective is to calculate the cost of an optimally designed, and effectively built, access network. This will be used to set the wholesale price of BT's access services which will, in turn, determine the economic value of the access network.

In Ofcom's opinion, the current cost of building and operating an efficient access network is the correct basis for setting regulated prices: "Ofcom believes that the appropriate policy objective is now to protect consumers, including through the development of retail competition based on regulated access to the local copper access network at charges based on cost (including the cost of capital). The relevant access network is that which would be built, in theory, by an efficient new entrant replicating BT's current functionality, reach and capacity."[10]

The purpose of the cost estimation exercise proposed by Ofcom is to estimate the cost that an 'efficient new entrant' would incur in building an access network which was equivalent to BT's. This is known as the Net Replacement Cost (NRC) and can be defined as:

[10] Ofcom consultation document, Valuing copper access, Dec 2004, paragraph 1.5

- The cost of the system that would be built to replace them;
- Plus the loss of revenue until the new system is ready;
- Less the present worth of any superiority in that new system's outputs;
- Less the present worth of savings arising from the postponement of replacement of the asset (it is newer than the one it replaced and will therefore last longer); and
- Less the present worth of any reduction in current operation and maintenance (O&M) costs.

In this section of the report, we evaluate the options proposed by Ofcom with respect to the concepts that underlie this definition of replacement costs.

In terms of valuing the assets of a regulated business, there are two overall approaches:

- The book value of the assets, possibly revalued to reflect changes in asset prices; and
- The economic value of assets derived from future cash-flows.

In a competitive market for all relevant resources, these two valuations should be the same or similar. However, in a regulated business, there may be a significant difference between the two. Where this is the case, it can be argued that the appropriate rule to apply in valuing the assets of the regulated business is the deprival rule, also known as the value to business (VTB) rule. This states that the value of the assets to their owner is the lower of:

- Their replacement cost; or
- The higher of their market value, or their scrap value[11].

Essentially, this represents the highest price that an owner could obtain for the assets, and therefore the value that they should be compensated for in the event that they are deprived of these assets. An alternative way of thinking of it is the amount that the owner would have to be compensated if the asset was taken away from the owner, in order to make them indifferent. Whilst the deprival value is simply that, a rule to decide between valuation approaches, we do believe that it provides a useful framework from which to consider the valuation of the BT access network. The Ofcom paper has appropriately applied this rule by focusing on replacement costs, i.e. replacement costs would appear to be below the NPV of expected cash flows which in turn would be far more valuable than any scrap value of the network. However, in order to be consistent with the deprival rule it clearly needs to take into account all appropriate replacement costs. In sections 4.4.2 (value of time) and 4.4.5 (scope of the network under consideration) we argue that the approach adopted by Ofcom does not achieve this goal.

[11] This may be more formally represented as the $Value = Min\left[DORC, Max\{PV, SV\}\right]$ *where:*
DORC represents the depreciated optimal replacement cost valuation of the asset (replacement cost). This is the equivalent of option 2 or 3 in the Ofcom consultation paper
PV represents the present value of cashflows earned from the asset
SV represents the scrap value of the asset

4.3 Ofcom's proposals

Four options are proposed for the methodology to calculate the cost of building a 'fully efficient network':

- *Option 1: BT's current methodology.* This involves estimating the inventory of the existing cooper network assets based on a sample of exchange areas. This asset inventory is multiplied by the current replacement costs of each type of asset to give the Gross Replacement Cost (GRC) of the sample of exchange areas. This value is then scaled up and adjusted to give an estimation of the full network's GRC;

- *Option 2: Optimised deployment of current technology.* This involves determining the 'optimum deployment' of the network to serve the current base of subscribers. It is based on a modelling exercise which uses geographical data on the distribution of customers, routes and the location of Main Distribution Frame (MDF) and customer Network Termination Equipment (NTE) or Distribution Points (DPs). This is combined with data on today's unit costs of access network equipment to give a current cost valuation of this model network;

- *Option 3: Optimised deployment of new technology.* This approach is similar to that described under option 2 but also includes alternative technologies to those deployed in BT's access network; and

- *Option 4: Varying asset and input prices.* This option is a variation on options 2 and 3 in that it considers using a different labour rate used in the valuation of the model network.

In section 5.12 of the paper, Ofcom notes that RegTP (the telecommunications regulatory authority in Germany) engaged a firm of consultants (WIK) to construct a model of Deutsche Telekom's access network. Ofcom report that they have engaged WIK to "…perform a similar exercise on behalf of Ofcom." However, we note that in its work in Germany, WIK uses a different definition of DP than Ofcom currently does in the UK. This is a more complete definition than the one proposed by Ofcom.

We assume that a similar approach will be applied by WIK in developing the access network model in the UK under options 2 and 3. This model will be used to calculate the net replacement cost of BT's access network using the current purchase price of network components. It is likely that the simplifying assumptions (including: network architecture constraints; technology choice; and, lack of shared networks) made in the proposed modelling approach will always lead to an inappropriately valued network.

4.4 Review of Ofcom's proposals

Two criteria determine the cost of an Efficient New Entrant (ENE). In summary these are:

- Whether the ENE's network has been optimally designed taking account of both future demand patterns and technology trends; and

- Whether the optimal network design has been efficiently built and operated.

Under option 1 the optimisation criterion is not an issue. It is assumed implicitly that BT's current network approximates an optimal network, and that BT's network planners made full

use of all technology and demand information available at the time. Option 1 provides the considerable advantages of simplicity, transparency and data reliability, allowing the accurate modelling of costs without the need for complex and over simplified optimisation. Thus the issue in option 1 is purely to determine the cost of an efficiently built network. Providing all assets are re-valued at an appropriate NRC, the derived valuation will be reliable.

Options 2 and 3 require the use of a fully specified model which inherently assumes perfect foresight, instantaneous network construction, and the use of complex optimisation algorithms. However, it is inconceivable that any model can produce a true optimally designed network.

BT's access network has been developed over a number of years. During this time, the available technology has changed, the customer base has grown and the relative price of network equipment has altered. It is, therefore, unlikely that BT's access network represents the same network that an efficient entrant would construct today with the benefit of hindsight.

Whilst we believe there is a theoretical basis for the approach suggested by Ofcom, it is critical that the approach adopted captures all of the costs that would be incurred by a new entrant. In the following section we highlight a number of key concerns in relation to the methodology suggested.

4.4.1 Scope of the network subject to valuation

KPMG have concerns regarding the scope of the network subject to valuation under all three options. Each option requires that all ENE assets are valued, and that GRC is appropriately reduced to NRC.

Two major adjustments are necessary to properly transition from BT's local access costs to those incurred by an ENE. These adjustments together add perhaps £4bn of GRC:

- The ENE would require drop wire if it was to meet the challenge of "replicating BT's current functionality, reach and capacity" to BT's current customers. Importantly, the WIK model in Germany ends at the 'DP', but goes on to define the DP existing in every home and office, i.e. what Ofcom current define as NTE. BT do not currently capitalise drop wire assets installed before 2000 in its regulatory accounts. This has a material impact on the deployment costs of an efficient new entrant and the valuation of BT's network. Our calculations below (figure 4.1) suggest total GRC would be £2.8bn; and

- Since these GRC/NRC costs are calculated under CCA, the assets included would not simply be those assets captured by BT in its latest regulatory accounts (which were originally captured under an HCA regime), but would be extended to include all those assets the theoretically efficient new entrant would be required to procure but are fully depreciated in the BT regulatory accounts, e.g. network management software. BT estimate that such assets have a GRC of £1.2bn.

Figure 4.1: Basis of calculation of gross replacement value of drop wires

Factor	Valuation basis
Premises in UK	27 million
Cost per telegraph DP	£80
Cost per underground DP	£160
% telegraph	*70%*
% underground	*30%*
Weighted Average cost per drop (£)	104
Gross Replacement Value (£m)	**2,808**

Source:KPMG

The above presents an illustrative valuation to outline the materiality of the impact of ignoring drop wires from the proposed Ofcom/WIK approach. KPMG would suggest the need for Ofcom to consider this asset class more carefully and to potentially uplift the WIK valuation to reflect the value to a theoretically efficient new entrant.

At the heart of an MEA valuation is the need to convert GRC into NRC. This is dependent on an assessment of the expected economic life of an asset and the actual life of the asset being replaced.

To determine a full NRC, Ofcom may have to consider the expected economic lives of the current BT asset base. A number of key assets, such as ducts have an indefinite economic life. We believe that BT currently uses a rolling 25 year life for much of its duct assets. Thus the conversion of GRC to NRC for these types of assets may lead to a NRC that is close to GRC.

Thus we believe significant additional assets need to be valued under all options.

4.4.2 Information

Both options 2 and 3 require the modelling of an optimal network which assumes that a new entrant has perfect information about current and future demand and makes perfectly optimal planning decisions. Option 3 makes a further assumption that the ENE has perfect knowledge of future technology. However, a new entrant which decided to rollout a new network would do so without perfect information. This lack of perfect foresight should not be used as a practical definition of an inefficient operator. The incremental growth of the network will tend to lead to a larger network than would have been necessary had the operator enjoyed perfect foresight. However, this is not a symptom of sub-optimal design or inefficient deployment, and BT should not be penalised for it.

Network planning decisions which are *ex-ante* optimal in the face of imperfect information about, for example, the distribution and extend of demand, may turn out to be suboptimal, *ex-post*. The methodology proposed by Ofcom under option 2 and option 3 does not appear to take this into account and assumes perfect foresight on the part of BT, a position that it is inconceivable to expect any operator – however efficient – to achieve

4.4.3 Time taken to roll-out network

A new entrant constructing a network would not be able to build it and bring it into service overnight. A network which covers the entire country would inevitably take a significant amount of time to construct. KPMG believe that to be consistent to the deprival rule it is critical that time is taken into account when estimating the cost that an efficient new entrant would incur in delivering access services. This would raise the costs of a new entrant for two reasons.

- *Delayed revenues.* If there is a delay between the beginning of expenditure on investment in the new network and the receipt of revenues from network services, then this will impose a cost on the entrant. This cost is equal to the present value of the foregone cash generated by the business. This can be illustrated with a simple example of an asset which costs £100 and generates £20 per year for 10 years. If the investment is made in Year 1 and revenues also begin in that year, the NPV of the net cash flows is £135.18 (discount factor is 10%). If the revenues do not begin until Year 2 but continue for the same length of time (i.e. Year 2 to Year 11), the NPV of the net cash flows is £122.19. The difference between the two scenarios is the cost associated with the delay in generating revenues. If investment is made in later years any difference between the two revenue streams would be greater, as would be the case in any telecommunications rollout.; and

- *Network externalities.* It could be argued that, although it takes time to build an access network across the whole of a country, it would not be necessary to complete the rollout before it could be used to generate revenues. This is correct. However, assuming Ofcom are trying to model a single network and not a competitor to BT as is the premise contained in Ofcom's paper, there would still be a cost associated with the time taken to rollout a full network. This is because the volume of traffic (and therefore the revenue) per line increases with the size of the network as a result of network externalities. For example, if there are 100 subscribers connected to the network, each subscriber can make calls to 99 other subscribers. However, if there are 1000 subscribers on the network, each one can make calls to 999 people. The value of the network per subscriber therefore increases with the size of the network. If it takes time to build a network and provide services to customers, the cost of the delay is the lower revenues that are generated when the network is smaller in the earlier years.

In practice, both of these effects are likely to affect a new entrant building a network in the UK.

4.4.4 Modelling specification

The WIK model applied in Germany considers the local loop between the MDF and distribution points. Lines between each distribution point (DP) and the primary socket within the user's premises are not considered, as these are dictated by the geographical location of premises.

This algorithm is repeated for the group of DPs connected to each PCP, namely:

- Subclusters are defined based on distance criteria;

- Each DP is connected to the PCP individually; and

- Connections that can be made linking two or more DPs to a PCP with the introduction of branch sleeves are calculated based on minimising the network length.

The approach to modelling an optimum access network proposed by Ofcom under options 2 and 3 is subject to a series of constraints including:

- *In defining an access network*. Ofcom defines this as the metallic path between the D side of the MDF and the DP. This is an incomplete definition. MDFs do not exist in isolation. They are accommodated in exchange buildings and they require power. The network does not stop at the DP. It must terminate at a consumer's premises. WIK[12] use a helpful definition where the cost of an access network is driven by lines, whereas the core network costs are driven by traffic. This cost causality can be used to assess the boundaries between core and access networks.

- *Network architecture constraints.* Under option 2, Ofcom indicates that the modelling of an optimum network will include a number of constraints. For example, Ofcom assumes that "the locations of the main distribution frame and the distribution points are fixed and then plans the optimum network to serve the existing customer base…"[13]. These constraints are imposed for practical modelling reasons and do not reflect the constraints that would actually be faced by a new entrant. In addition to imposing constraints which would not be faced by an entrant, Ofcom have not mentioned constraints which would, in practice, be faced by a new entrant. These include a large number of the technical, legal/planning and physical constraints that BT is also subject to. Failure to include all of these constraints in the network modelling would result in a network design which a new entrant would not be able to construct. Indeed, the FCC has recently questioned whether "there is any theoretical basis for an approach that does not assume the existence of existing roads, buildings, and natural obstacles"[14]. Ofcom's suggested modelling approach makes a series of simplifying assumptions. The model assumes a theoretically optimal distance between MDF, PCP and DPs. This will produce 'optimised', but in practice unbuildable, networks as the new entrant encounters difficulties with planning consent, property availability, wayleaves and many other obstacles. Indeed, any specified model will be most unlikely to accurately reflect reality, i.e. the need to insert ducting down both sides of a street; and

- *Technology choice.* Under option 3, Ofcom proposes to consider alternative technologies. However, under option 3, several significant constraints are proposed "The analysis undertaken for Ofcom will consider whether the use of active PCPs and other related improvements, could provide a lower cost solution. Alternative radio-based technologies have not been considered…"[15]; and

- *No shared networks.* Entrants providing an alternative access network might seek to share costs with other services. Cable networks are a clear example of this in which TV cable and telephone lines share trenches and ducts. Alternative scenarios might include wireless technologies such as the provision of voice communication over broadband wireless networks.

[12] Analytical Cost Model, Ofcom - Local Loop Consultation Document 2, November 2000, page 1
[13] Ofcom consultation document, Valuing Copper Access, Dec 2004, paragraph 5.14
[14] FCC 03-224, 13 September 2003, paragraph 63
[15] Ofcom consultation document, Valuing Copper Access, Dec 2004, paragraph 5.20

In summary, the Ofcom/WIK approach imposes a number of critical constraints for practical modelling reasons and not because they may reflect the costs that a new entrant would actually incur in providing access services. This limits the credibility of the modelling approach as a means of calculating the cost that a new entrant would incur in providing the services

In addition to the constraints described above the theoretically correct approach adopted by Ofcom to model options 2 and 3, is one fraught with practical difficulties. These include:

- *Exclusion of core network considerations*. WIK and Ofcom favour a 'Scorched Node'-type approach to access network design. We accept this makes modelling easier. However, the cost of an optimal access network is partially dependent upon the design of an optimal core network. The close relationship between access and core network design is illustrated in the high degree of shared duct. Ofcom state that 40% of total duct is shared. An optimally designed access and core network may well result in a materially different figure.

- *Incremental network growth.* In reality a network is not planned and built in one time period, but is built incrementally. For example, initial PC and DP locations are driven by period 1 demand. Once a PCP is in place it is costly to reposition. Future DP positions are largely determined by historic constraints of prior period PCP locations. If Ofcom decide to carry out further revaluations it will need to take into account the cost of re-sighting PCPs from the previous model. These costs are likely to be substantial. In addition, any optimised technology deployed today would not be the optimal technology in future periods. The approach to network cost modelling described by Ofcom does not take these costs into account.

- *Incorrect optimisation.* The approach proposed by Ofcom under both option 2 and option 3 is based on an incorrect specification of the optimisation problem. An efficient entrant would build a network which was designed to provide access services to an evolving customer base. They would therefore take into account future growth in demand when constructing the network. It is therefore likely that, at any point in time, the existing network will not be the least-cost design for the pattern of demand that exists at that time. The approach described by Ofcom indicates that the model will estimate a least-cost model for demand at a single point in time. This is an incorrect specification of the optimisation problem faced by network planners.

4.5 Future investment

Ofcom have not provided an indication of the basis on which they intend to set prices for BT's access services in future, i.e. following the initial revaluation. It is possible to think of a number of ways in which this could be done.

The valuation of new investment to meet new demand could be based on the amount that would be required by an efficient new entrant, extending the optimal network calculated by the model. Since this additional cost would represent the cost of extending a hypothetical network, it is unlikely that it would be the same as the cost that BT would incur in extending its own network. If this approach were to be adopted, BT would be prevented *ex-ante* from recovering the cost of meeting new demand which it is required to meet under its Universal Service Obligation (USO),

even if it is the least cost way of extending BT's current network. This would reduce incentives for BT to invest and may harm the interests of consumers.

Alternatively, the valuation of investment for expanding the network could be based on the least cost expansion of BT's existing network. If this were the case, Ofcom would be applying inconsistent assumptions about the value of BT's access network. This inconsistency is likely to further raise uncertainty and regulatory risk.

Ofcom have not yet published its proposals for valuing new investment and this represents a significant omission from the paper, which creates uncertainty and risk for investors. It is also inconsistent with its approach to regulating investment outlined in its consultation on the cost of capital, which suggests that "Unpredictable changes in regulatory policy could have an adverse impact on the incentives for investors to engage in discretionary equity-financed investments. Ofcom therefore believes that it is important that it provides regulatory guidance about the future treatment of past investment to feed into investors' expectations about those investments, and that it commits to appropriate treatment of past investments in order to ensure assets are not expropriated and investors are suitably compensated for unforeseeable policy change."[16]

4.6 Impact of revaluation on BT

4.6.1 Ofcom's current proposals

Ofcom have indicated that they will continue to apply the Financial Capital Maintenance (FCM) approach when setting the regulatory prices for BT's access network. FCM is an approach to accounting for changes in prices in order to protect the value of financial capital invested in the firm by shareholders and the providers of debt. The main alternative methodology is operating capital maintenance (OCM) which, as the name suggests, aims to protect the productive capacity of the regulated firm – ensuring that the firm has sufficient revenue to continue at the same level of operations.

The implication of FCM is that any change in the value of a firm's existing assets during the course of a year has to be matched by an allowance in the firm's revenue. This can be illustrated by showing how FCM works under a current cost accounting (CCA) approach. Under CCA (based on modern replacement costs) the value of existing assets is updated to reflect changes in the replacement cost of modern assets. Asset values can be increased or decreased.

If modern assets are more expensive than the existing assets, then the Gross Replacement Cost (GRC) of the assets increases, i.e. their CCA value. This results in a *holding gain* for the firm. If modern assets are cheaper than the existing assets, then the GRC of the assets decreases. This results in a *holding loss* for the firm.

As such, the basis for setting prices for the regulatory period should be based on:

Returns on assets +Current cost depreciation, minus(plus) holding gains(losses)

[16] Ofcom consultation document, Valuing copper access, Dec 2004, paragraph 2.12

The logic behind this is straightforward. FCM aims to provide the firm (and its investors) with a fair return on its original investment. As a result any holding gain is subtracted from the revenue allowance for the firm and any holding loss is added to the revenue requirement. This ensures that the NPV of future cash flows is maintained.

Ofcom is proposing to revalue the assets in BT's copper network and to set prices based on a FCM approach. The paper highlights the impact of a downward valuation of assets: "The prices of wholesale services supplied by BT are set to allow it to recover its efficiently incurred costs together with a fair return on its capital employed. This return should incorporate consideration of any holding losses. Accordingly, in the event of a decrease in valuation of the asset, in order to allow the firm an overall rate of return which was in line with the cost of capital plus efficiently incurred operating costs, margins would have to be increased during the period over which the loss was recognised in order to compensate shareholders for the decrease in value of the asset (the holding loss, which serves to increase costs). The most obvious way to increase the margins to take account of the holding loss would be to increase regulated prices for the period over which the holding gain is recognised"[17].

Given that, under FCM, investors are compensated for the effect of asset revaluations it can be argued that the firm should be indifferent to the scale of the revaluation. In other words, the returns to investors of the expected cash-flows from the investment will be unaffected by the revaluation. However, there are a number of reasons why any revaluation may have a material impact on the firm and its investors:

- *Incorrect rate of return.* If the proposed return on capital was above the true cost of capital then the firm would benefit financially if the assets were not revalued downwards. Conversely if the return on capital was below the true cost of capital then the firm would benefit from the assets being revalued downwards;

- *Regulatory risk.* The prospect of periodic and significant revaluations may increase the investors' perception of regulatory risk. The exact application of FCM under CCA accounting implies that holding losses should be added to the revenue requirement in the year that the adjustment is made. The fear might be that Ofcom would be reluctant to allow prices to follow the pattern required by FCM. For example, in the paper Ofcom state that, "if it were to be found that there was a holding loss arising from the change in valuation, an immediate reflection of any holding loss when setting prices may create unwelcome volatility and uncertainty for both operators and consumers. Accordingly, in the event of any change in valuation, Ofcom would have to consider whether it was appropriate to reflect this in charges and if so whether, when setting prices, it might be more appropriate to spread the impact of any resultant holding loss over several periods in order to create a smoothed glide path to the appropriate valuation."[18]

  Ofcom's suggestion of phasing the recovery of the holding loss over a number of years is still consistent with the FCM approach. However, the passage indicates that Ofcom is concerned about the impact of holding losses on the stability of prices. Investors may be concerned that, in future, faced with the similar situation Ofcom may be under pressure to move away from the FCM methodology;

[17] Ofcom consultation document, Valuing Copper Access, Dec 2004, paragraph 7.4
[18] Ofcom consultation document, Valuing Copper Access, Dec 2004, paragraph 7.5

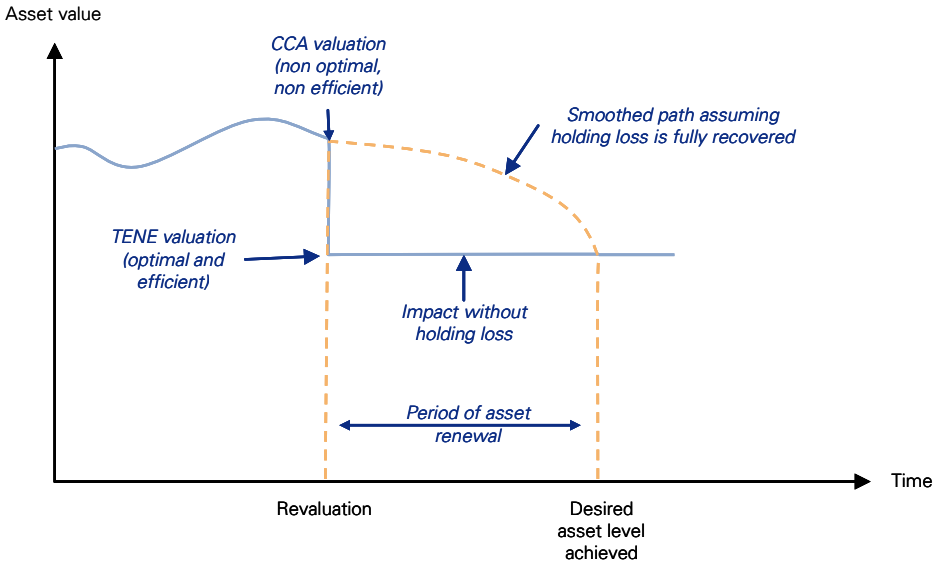
- *Limits on capital structure.* The prospect of significant revaluations may affect the firm's ability to pursue an optimal capital structure. In recent years many utility companies have secured efficient financing through long-term bond issues linked to the asset values of the firm. This has proved an attractive structure for potential investors, based on the stability of cash-flows and asset values in these utilities. The possibility of significant asset revaluations (and the associated re-profiling of cash-flows) may prevent this type of financing arrangement and require the firm to maintain a higher level of flexibility and equity liquidity in its financing than it would otherwise choose; and

- *Managerial incentives.* There is some evidence that investors try to influence the financial leverage of the firm to provide the managers with the correct incentives to act efficiently. For example, a higher proportion of debt finance increases the risk to managers of poor performance and therefore improves the incentives to deliver good performance. Asset revaluations may significantly alter the profile cash-flows for the firm, with knock-on effects on the incentives for management.

Ofcom need to be consistent in how they take account of holding gains and losses between price control periods, as the impact cannot be reflected during the price control period. However, even if Ofcom continues to apply an FCM approach, as it has indicated that it is likely to do, a downward revaluation of BT's access network could potentially have an adverse financial impact on BT for the reasons noted above, and adds to the financial risk faced by BT.

Ofcom currently assume that BT's CCA valuation represents a non-optimal, non-efficient operator, and want to model it against a theoretically optimal and efficient operator in order to reduce prices. Given Ofcom's methodology and assuming that it will apply the new valuation to any new investment, the glide path of BT's assets will be that of figure 4.2 below. Figure 4.2 assumes that the holding loss is spread over the full life of remaining assets to avoid any price increases, and therefore asset values will fall in line with the investment cycle, i.e. new additions to the network are valued at the "TENE .asset valuation" level, but existing assets are effectively valued at their existing level due to the use of FCM over the value of these assets. This approach is fully consistent with an FCM approach.

Figure 4.2: Comparison path of assets given a lower valuation for the TENE



Source: KPMG

Whilst Ofcom could impose a series of regulatory instruments to achieve the position identified above, we would argue that in order to remain consistent with the principles of FCM it should ensure that the NPV obtained by BT should match that which would be available under the approach demonstrated in figure 4.2.

4.6.2 Will Ofcom allow all / part of the holding loss?

The clearest danger for BT is that Ofcom may choose not to allow all or any of the valuation changes identified (according to the Ofcom paper likely to be a reduction) to be matched by a holding loss. It is clearly critical that Ofcom make a commitment to BT that this is not their intention and that – if this approach is followed – they intend to remain loyal to the principles of FCM and match any valuation change with a holding loss or gain.

In the paper Ofcom suggest that "in the event of any change in valuation, Ofcom would have to consider whether it was appropriate to reflect this in charges"[19], effectively providing a route through which it may avoid passing the full value of the holding loss to BT. The impact of such an approach to BT would be critical to the valuation of the company and hence the future path of the telecommunications sector within the UK. Likely impacts include:

- A fall in the value of BT and its share price;
- Reduced incentives for the company to reinvest alongside an increased cost of capital; and
- The need for BT to factor in a level of regulatory risk and uncertainty into all decisions.

[19] Ofcom consultation document, Valuing Copper Access, Dec 2004, paragraph 7.5

The theoretical rationale for not providing a holding loss could be that in a competitive market, if a new technology overtook the existing technology, an investor would loose the value of non depreciated assets. The implication here would be that there should be no holding loss applied. However, we note that the competitive market analogy is incorrect as BT has invested heavily in sunk costs in the local access network, at least partly in order to meet the USO requirements imposed by Ofcom. Furthermore, Ofcom themselves argue that this market is not competitive – although we partially contend this – and it would therefore be inconsistent to apply this approach.

We also note that any such approach that did not fully match a change in valuation with a holding loss would be totally inconsistent with the FCM structure identified within the Ofcom paper. Furthermore, as Ofcom do not explicitly seek views of parties on this issue and given the potential importance of this point, we would suggest that this raises considerable concerns as to the consultation process itself if Ofcom were to subsequently adopt this approach.

4.7 Case studies

Providing accurate valuations of regulated assets is a relatively new area of study, and has produced a variety of responses from regulators. There are a limited number of cases where it has been used in the telecommunications sector. There are further cases in non-telecom sectors, which although not strictly relevant do illustrate some of the issues discussed.

In this section, we provide a summary of cases where the modelling of optimal costs is used to set regulatory charges. In particular, we note that;

- In the US, regulatory opinion is moving away from the type of analysis proposed by Ofcom/WIK due to issues surrounding the appropriateness of defining an efficient network and the inherent modelling problems;
- In Ireland, the regulator has had great difficulty arriving at an appropriate asset valuation model and is facing judicial review; and
- In Australia, who pioneered the use of this methodology, there has been a reappraisal of its use as an ongoing valuation tool due to fears over its impact on new investment

4.7.1 US

In the Local Competition Order (1996), the FCC adopted TELRIC[20] as the basis for setting LLU[21] charges in the US in an attempt to ensure that prices provided 'appropriate economic signals for competitive and investment purposes'[22]. This methodology calculates 'the cost today of building and operating an efficient facility…"[23]. The legality of the use of TELRIC was confirmed by the Supreme Court in *Verizon v. FCC.*

[20] Total Element Long Run Incremental Cost
[21] Referred to by the FCC as "Unbundled Network Elements" (UNE)
[22] FCC 03-224, 13 September 2003, paragraph 2
[23] Ibid

The application of TELRIC has resulted in long and complex rate-making proceedings and there has been considerable uncertainty concerning the outcomes: "Because of the general nature of our rules, state commission have wide latitude in applying the 'most efficient technology' standard under the current rules. This creates the potential for a TELRIC proceeding to become a 'black box' from which a variety of possible rates may emerge….The lack of predictability in UNE rates is difficult to reconcile which out desire that UNE prices send correct economic signals."[24]

In September 2003, the FCC launched a review of the existing approach to calculating the cost of access network elements. This review covered a number of major aspects of the TELRIC methodology. Two of the key issues considered that are relevant to Ofcom's current consultation on the valuation of BT's network were:

- *The use of the most efficient technology.* The FCC questioned the assumption that "…the latest technology is deployed throughout the hypothetical network, while at the same time assuming that this hypothetical network benefits from the economies of scale associated with serving all of the lines in a study area"[25]. The FCC "…tentatively conclude[d] that our TELRIC rules should more closely account for the real-world attributes of the routing and topography of an incumbent's network in the development of forward-looking costs."[26]; and

- *Network routing and construction.* The FCC questioned whether "there is any theoretical basis for an approach that does not assume the existence of existing roads, buildings, and natural obstacles"[27]. It tentatively concluded that "…prices should account for the real-world attributes of the routing and topography of an incumbent LEC's network"[28].

4.7.2 Ireland

Local Loop Unbundling (LLU) was introduced in Ireland in January 2000 and the level of charges for the service has been a subject of contention between the operators and the regulatory authority for a number of years. A number of decisions on charges made by the Irish regulatory authority have been challenged by way of Judicial Review proceedings.

ComReg and its predecessor ODTR argued that LLU charges should be based on Long Run Incremental Cost (LRIC). This is based on the costs that would be incurred by an efficient new entrant using modern equivalent assets (MEA), including both capital costs and operating costs.

An industry group (IAG2) was established by the regulator to expedite the introduction of LRIC-based charges for LLU services. This group discussed and agreed a number of principles involved in the calculation of the LRIC costs of the access network. However, a number of issues remained outstanding, including an appropriate level of operating costs to include in LLU

[24] FCC 03-224, 13 September 2003, paragraph 7
[25] FCC 03-224, 13 September 2003, paragraph 50
[26] FCC 03-224, 13 September 2003, paragraph 52
[27] FCC 03-224, 13 September 2003, paragraph 63
[28] Ibid

charges and the correct level of capital equipment prices. ComReg issued consultations on these issues during 2004 and issued a decision on charges on 30 August 2004[29].

We do not have access to the details of the cost model developed by IAG2 for the purpose of calculating LLU LRIC costs. However, it is our understanding that charges for LLU are based on an optimised network using a 'scorched node' approach and current asset prices. Operating costs were estimated by ComReg and benchmarked against network operating costs of operators in other countries. It is also our understanding that no allowance is made for holding losses in the calculation of these costs.

4.7.3 Australia

The electricity transmission regulatory framework in Australia provides for the writing down of the asset values according to efficient network costs. This is referred to as DORC. Some key features of DORC are that it:

- Seeks to mimic the outcomes of a competitive market;
- Minimises the risk of significant tariff shocks as asset replacement becomes necessary (compared with depreciated historical cost);
- Helps deter inefficient by-pass of the network – as values in excess of DORC are likely to imply pricing that exposes the Transmission Network Service Provider (TNSP) to being by-passed; and
- Reflects the maximum price that a firm would be willing to pay for 'second hand' assets – if value was set above DORC, customers would be better off if the system were scrapped and replaced by new assets.

4.7.3.1 Electricity transmission

Over the past few years, there has been much debate about the optimisation risk inherent in the use of DORC. TNSPs have been able to claim that optimisation risk either deters them from investing or requires them to duplicate other assets to avoid the risk of low asset utilisation resulting in optimisation. In response, the ACCC has proposed that in future it will not seek to periodically revalue the Regulatory Asset Base (RAB) of TNSPs in accordance with DORC (or ODV), but will 'lock in' the value of the RAB from the start of the prior regulatory period and adjust for:

- Inflation;
- Depreciation; and
- Capital expenditure incurred during the period.

[29] Comreg, 04/91; http://www.comreg.ie/_fileupload/publications/ComReg0491.pdf

The NEC will continue to provide the ACCC with discretion to revalue assets. If a TNSP proposes a revaluation, the ACCC has said that it will consider the proposal on its merits. The onus will be on the TNSP to make a case for departing from the locked-in RAB. If it were to revalue the RAB, the ACCC has stated a preference for reopening the entire valuation and consider each element, to avoid the risk that TNSPs may seek to 'cherry pick' particular asset valuations.

4.7.3.2 Electricity distribution

NEM electricity distribution networks are regulated by State and Territory jurisdictional regulators. Asset valuations are effectively based on a lock in and roll forward methodology. Initial network valuations were based on DORC and published by the relevant jurisdictional governments in jurisdictional instruments. The jurisdictional regulators are typically required to apply the initial DORC valuations for sunk assets in regulatory reviews, adding in capital expenditure, inflation and depreciation as required (see, for example, the Victorian Tariff Order, clause 5.10, page 89: http://www.esc.vic.gov.au/electricity281.html).

4.7.3.3 Gas networks

Gas pipelines are regulated under the National Third Party Access Code for Natural Gas Pipeline Systems (Gas Code, see the code registrar website at: http://www.coderegistrar.sa.gov.au). The Gas Code provides flexibility in the principles to be used for the valuation of the initial capital base, with reference to DORC and the writing down the value of redundant assets (see chapter 8 generally, especially clauses 8.10-8.13 and 8.29-8.29).

In practice, the ACCC values existing gas transmission pipelines on a lock in and roll forward basis. The desire for consistency was cited by the ACCC as one of the advantages of moving to this methodology in electricity transmission (see SRP Background Paper, p39). The treatment of gas distribution pipelines is determined by the relevant jurisdictional instruments (see, for example, the Victorian Tariff Order: http://www.esc.vic.gov.au/apps/page/user/pdf/GasTariffOrder_Updated20June03.pdf at clause 9.2, which allows for the writing down of redundant capital). In practice, though, it is unlikely that distribution networks would be written down or 'optimised' due to by-pass.

5 Windfall gains and 'clawback'

5.1 Ofcom position

In 1997 Oftel decided to change the regulatory accounting method that is used to regulate BT to one that was consistent with its forward looking costing methodology for regulatory decisions, Forward Looking Long Run Incremental Costs (FL-LRIC). Because LRIC is a forward looking concept, it was determined that this would be more appropriately reflected by the use of CCA than the previously employed HCA. They found two reasons for making this change:

- "Forward looking costs reflect resource costs and therefore the setting of prices on this basis encourages economic efficiency; and

- Since replacement costs would be the costs faced by a new entrant, the setting of charges based on forward looking costs provides signals to potential entrants that encourage efficient entry into and exit from interconnection services."[30]

Under either accounting principle, if applied consistently over time, the NPV of revenues is equivalent. However, if a change is made between the two methodologies during the course of an assets life a disparity may arise between the NPV of revenues under HCA, and the NPV of revenues under CCA. Ofcom call this disparity in NPV revenues a 'windfall', and propose to use any 'windfall', which they assume will be a gain, to offset any possible holding losses, and hence price rises, that may result from a downward re-evaluation of the copper access network.

5.1.1 A worked example to demonstrate Ofcom's position

In this section we lay out a simplified worked example[31] to demonstrate Ofcom's position. For the purposes of this example we have made some simplifying assumptions:

- There is a single asset, and it is bought in year 1 for a value of 1000;

- The asset has a life of ten years, and under HCA is depreciated on a straight line basis;

- The CCA depreciation charge is estimated by deriving the ratio of depreciation as estimated under HCA to the original cost of acquiring the asset under HCA and applying this to the GRC in order to drive the write down CCA value, known as the NRC;

- Costs have been simplified to only include those which are treated differently under the two methodologies. We have, therefore, not included an estimation of operating or other costs in our treatment of allowable costs;

- The asset appreciates at 5% a year;

[30] Ofcom consultation document, Valuing Copper Access, Dec 2004, Annex 4 paragraph 5

[31] The full data set can be found at appendix A

- Yearly returns are calculated at 10%, and based on the mid year value of the NBV or NRC; and

- Revenues are discounted at 10% a year.

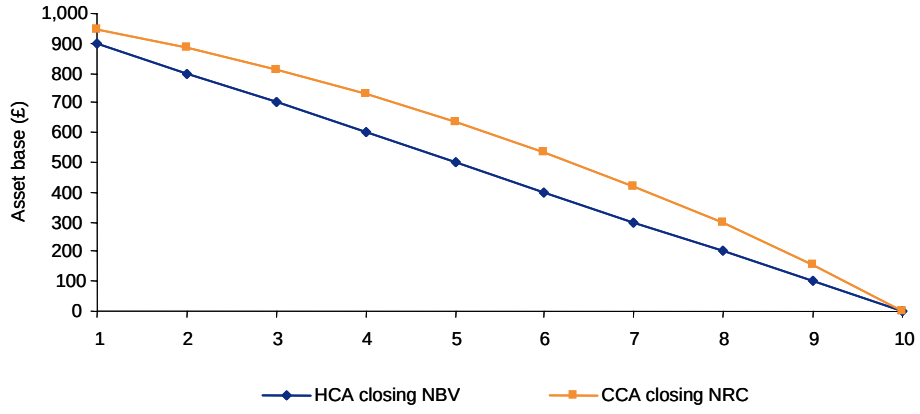
The calculations contained in our theoretical example allow the graphical comparison of the following variables in order to derive Ofcom's premise:

- The path of the value of assets over time and hence the return that you would be able to generate from those assets (see figure 5.1 below);

- The costs which would be recoverable by BT (see figure 5.2 below); and

- The discounted revenues that would be achieved under each (see figure 5.3 below).

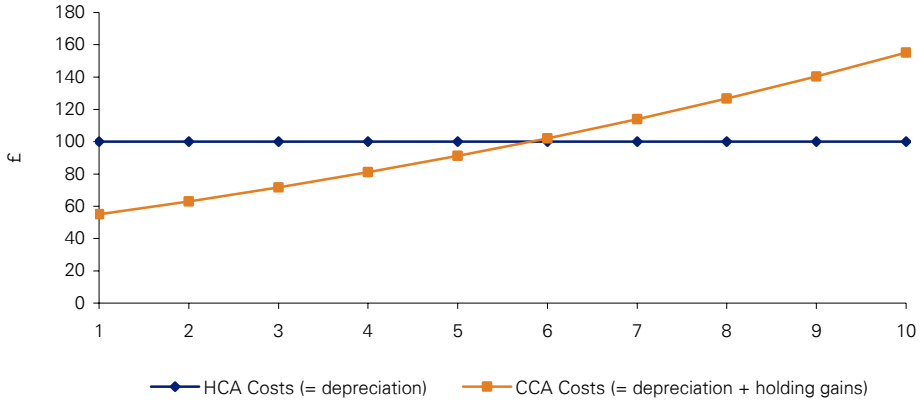
Figure 5.1: Asset base from which returns are calculated



Source: KPMG

Figure 5.1 shows that the NRC under CCA will be higher across the period as the asset appreciates over time. However, the cash returns to the business are the same, as shown below.

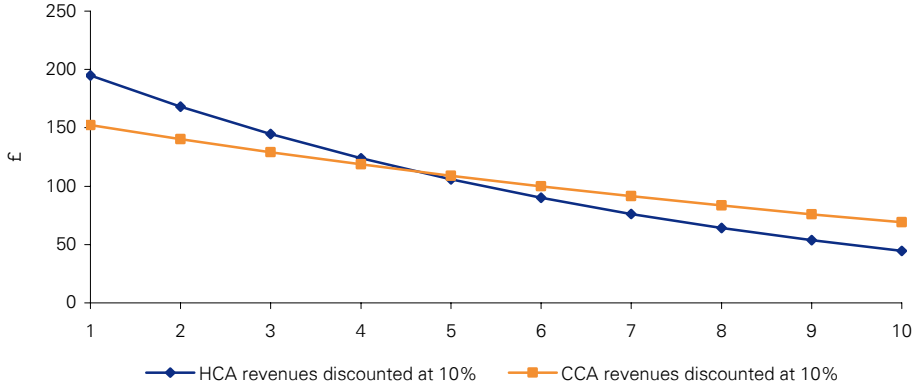
Figure 5.2: Recoverable costs



Source: KPMG

Figure 5.2 shows the allowable costs that a regulated company is allowed to recover. In this example under a HCA methodology the allowable costs are equal to depreciation, and as the asset depreciates on a straight line basis, they are constant over time. Under a CCA methodology, allowable costs are equal to the depreciation charge, which increases over time as the asset appreciates in value, minus the in year credit (holding gain) as a result of the asset appreciating in value[32]. In the early years of an assets life, the net cost to be recovered, being the depreciation charge, which increases with time as a result of the appreciating asset, net of the holding gain (i.e. the full amount of the appreciation), and gives rise to allowable costs being lower.

Figure 5.3: Discounted revenue streams



Source: KPMG

[32] See section 4.6 for a full consideration of how holding gains and losses are treated under a FCM approach.

Figure 5.3 shows the discounted impact on revenues of figures 5.1 and 5.2, and is equivalent to figure 5 in Ofcom's paper. Revenues are, therefore, higher in the initial period under a HCA methodology than under a CCA methodology. In our simplified worked example, ignoring the impact of change in working capital, the profile of revenues can be used as a proxy for the cash flows of the business. Under either accounting principle, if applied consistently over time, the NPV of revenues is equivalent.

However, if a change is made between the two methodologies during the course of an assets life a disparity is created between the total discounted revenues earned under HCA, and those that were earned using a mix of the two methodologies. Ofcom call this disparity in discounted revenues a 'windfall'. As can be seen from the figure above, with an appreciating asset base over time, the change from HCA to CCA could result in a gain. This issue is considered in the following section.

5.2 The windfall gain

5.2.1 What is the windfall?

Ofcom suggest that the windfall will be calculated as the difference between "the returns that were earned under the CCA convention to those which would have been earned had the HCA convention been retained"[33], given the switch between the two methodologies in 1997.

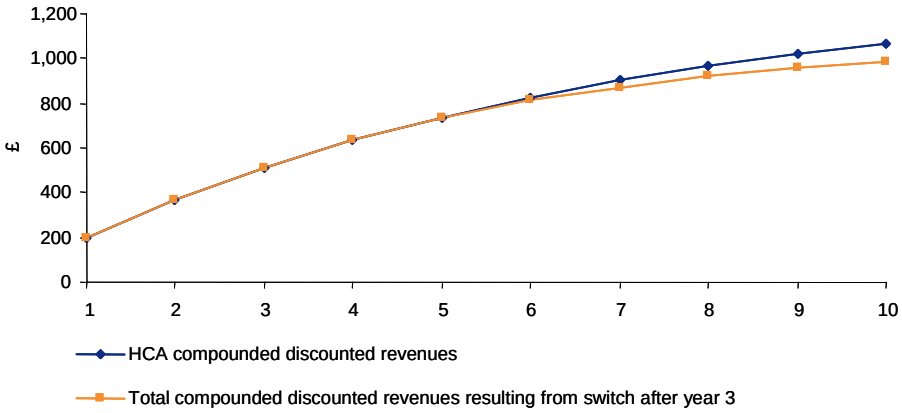
Ofcom are right in their assertion that a windfall gain would result from a switch, after the first period, from a HCA basis to a CCA basis if the assets continually appreciated over time. This results from the basic premise that revenue is calculated based on the value of assets, plus allowable costs (depreciation charges plus any holding gains or losses), and therefore under HCA those assets earn a higher revenue in earlier years. This is easily shown with reference to figure 5.3. If we assume that the accounting change was made after year five, the regulated firm would earn the higher revenue before and after the change was made. The difference between the CCA and HCA graphs after year five is the windfall gain.

5.2.2 Accounting for appreciation / depreciation

The analysis of the windfall changes substantially if the assets have not appreciated continually overtime. In accounting terms, one has to look at the Net Book Value of the assets under a HCA methodology, and the Net Replacement Cost of the assets under a CCA methodology at the time of the switch to identify the size and direction of the windfall. If the assets were depreciating before the switch (assuming the switch was made after year 3), and hence NRC<NBV, then the revenues generated over the life of the assets will be lower under CCA than HCA. This is represented in figure 5.4 below, and more fully in appendix B.

[33] Ofcom consultation document, Valuing Copper Access, Dec 2004, paragraph 7.13

Figure 5.4: Comparison of revenues assuming falling asset prices prior to switch



Source: KPMG

Interestingly, the impact of any appreciation or depreciation in assets after the change in methodology occurs does not impact total discounted revenues, as the changes are accounted for in the year that they occur through the holding charge applied to the accounts. This is demonstrated in appendix C, and holds true to the fact that under either methodology the total discounted cash flows will be equivalent assuming that the methodology was applied consistently from the day the assets were registered in the accounts.

5.2.3 Need for consistent treatment

If Ofcom do decide to carryout an analysis of the windfall and attempt to clawback this through a one off charge to the accounts, despite the arguments presented above, then Ofcom must be willing to accept that a windfall loss may have occurred and that prices may have to increase as a result.

It is also arbitrary that Ofcom should decide to focus on correcting only this assumption. Is it not therefore reasonable to ask Ofcom to check all assumptions that were made across the whole network when setting price controls? We believe that this would not be feasible or desirable for obvious reasons, and therefore find it totally inconsistent for Ofcom to choose to adopt this methodology only where it may suit to do so.

Moreover, when calculating the extent of any windfall, it is imperative that one looks at the whole set of assets from which revenues are generated. In the case of the copper access network, this would include all assets that were needed to provide the service such as the computers and software that run the exchanges, the test equipment needed to make sure the service was operating efficiently, and the proportion of motor transport that was used in delivering the services. Copper and duct make up the largest proportion of costs within the access network at

nearly £6.5bn, but nearly £1bn of other assets are also used. As BT do not earn a return on copper and duct only, it would not be correct to look at these assets in isolation, and we must look at all assets involved in being able to sell the end product, e.g. in providing wholesale line rental and local loop unbundling products.

5.3 Is clawback an appropriate response?

The clawback of any windfall gains that may have been made under the change from a HCA basis to a CCA basis undermines the principles of price incentive regulation. Price regulation has, up until now, been forward looking, modelling the results for the future period to be covered by the price control. Adopting this approach takes account of predicted price changes and their consequences for holding gains and losses and sets the price control to give a reasonable return for a reasonable performance on efficiency. A good regulator will make some smoothed assumptions regarding the volatility of assets over the period of the price control and will accept the consequences with no going back. Any changes to the price control for future periods may take account of exogenous changes in prior price control periods, but cannot retrospectively take back the exogenous impacts.

Good price regulation is also designed to incentivise the regulated company by allowing the company to keep the gains from over achieving on its efficiency targets. The regulator cannot distinguish between whether these gains are a result of increased efficiency or changes outside the control of the company. If the regulator retrospectively tries to clawback any of the revenue that the regulated company made during the regulatory period it is effectively breaking the incentives of the firm to over deliver. Moreover, by attempting to clawback revenues the regulator will be distorting the current allocation of resources. Any misallocation of resources that happened in the past should not be corrected by future misallocations.

One of the main reasons for applying a price control is to ensure that a regulated company can make a reasonable return on its investment that includes replacing the assets it currently owns. If Ofcom wants, through the clawback, to effectively change the price control for a previous period then it undermines the relationship between all regulators and their regulated companies. This will undoubtedly increase the uncertainty that regulated companies face regarding the ability to earn an adequate return during later price control periods, and could increase the cost of capital for regulated companies as a whole. This is likely to have an impact on BT's competitors more than on BT due to the financial positions of the companies operating in the sector, and could effectively choke off the market to new entrants. Ofcom's decision will, therefore, have the effect of increasing regulatory risk and destabilising the equity and capital markets which regulated firms rely on for investment.

Ofcom also propose to decide on 'the period over which the holding loss is recognised'[34]. We appreciate that Ofcom has a duty to protect customers, and understand that it may be necessary to smooth the impact of any change. However, in order to be consistent with the CCA approach any holding loss or gain would need to be fully reflected in the accounts through a one off holding charge, and that after the period in which the charge was applied there would need to be certainty in the values used in future periods. This is consistent with a forward looking price control which the regulator should be looking to apply.

Finally, we note that the paper does not comply with the over arching principles of regulation laid out by the Better Regulation Task Force (BRTF)[35], namely:

- The case for a regulation should be clearly made and the purpose clearly communicated: Ofcom have not clearly stated why the clawback should be made and how the clawback would fulfil its regulatory duty to protect consumers;
- Any enforcement action, i.e. inspection, sanctions etc., should be in proportion to the risk, with penalties proportionate to the harm done: The risk to the market from applying a retrospective clawback is greater than the potential consumer benefits (which may be negative) and is not in proportion to the harm done over the regulatory period we are concerned with;
- New regulations should be consistent with existing regulations: There is little precedent for retrospective clawbacks, especially where they are based on a mistake;
- Departmental regulators should be consistent with each other: The clawback could upset the balance between the regulator and the regulated across all regulated sectors, and increase the uncertainty faced by regulated firms; and
- Where possible, a goals based approach should be used, with enforcers and those being regulated given flexibility in deciding how best to achieve clear, unambiguous targets: Ofcom propose a direct form of regulation with no alternatives for achieving the aim considered. Indeed, the aim of the clawback is itself not clearly identified.

5.4 Increased regulatory burden and uncertainty

Ofcom state in their paper that "future asset values are unpredictable…..it is [therefore] difficult to quantify likely windfall gains or losses in advance". It also states that "at the time of this change it was argued that there would be no such windfall gain during the 1997-2001 retail price cap"[36]. However, the analysis presented above shows that there is no impact on the overall size of the windfall following a change in accounting convention, from changes to asset values in periods following the change (see section 5.2.2). Therefore, it is only important to consider changes in the value of assets prior to the year in which the switch was made. This raises the question that Oftel simply did not take into account the difference in the NBV and NRC, and the resulting revenues that would have been generated at the time the change was made. However, as Oftel knew that the price charged by BT was fixed by the price control and couldn't vary each year in line with movements in asset values as illustrated above to take account of appreciating /depreciating assets, it may not have consider the issue important enough to spend

[34] Ofcom consultation document, Valuing Copper Access, Dec 2004, paragraph 7.4
[35] Better Regulation Task Force report on Economic Regulators, July 2001
[36] Ofcom consultation document, Valuing Copper Access, Dec 2004, paragraph 1.11

public resources on it. Indeed, BT argue that under CCA it has earned less revenue than it would have done under HCA.

Moreover, if Ofcom apply this methodology retrospectively, then it is possible that all decisions made during the period 1997-2004 which relied on LRIC (and hence the costs faced by BT) would be being changed. This argument follows from the fact that Ofcom are, in effect, planning to retrospectively change the cost base that BT was operating under and hence the calculation of LRIC.

If Ofcom do proceed with this methodology, it is difficult to see how they would argue against applying it over the whole network where the change from HCA to CCA was made (in accordance with regulatory principles). This will increase the regulatory burden further and potentially opens up a myriad of other areas for retrospective claims which could potentially be both positive and negative in their impact on consumers.

Ofcom may wish to produce a regulatory impact assessment for the introduction of this change that shows the costs, including regulatory compliance costs for both BT and Ofcom, are justified by the benefits. Patricia Hewitt committed Ofcom to 'setting out a clear assessment of the impact of major proposals' during her response to the better regulation task force's report on economic regulators, and if such an analysis wasn't produced Ofcom could again find itself open to challenges.

5.5 Routes through which the clawback may be challenged

Based on the above analysis, and the fact that Ofcom have not considered alternatives to achieving its aim in the paper, Ofcom will be breaking the principles of good regulation, and may find that it opens itself up to criticism and legal challenge. Whilst we are not providing legal advice and cannot comment on the appropriateness of any legal action, we have highlighted below four potential ways in which redress maybe sought, and for which precedent exists:

- Judicial review;
- Appeal to the Competition Appeals Tribunal,
- Reference to the Competition Commission; and
- Class action by shareholders.

A Example methodology – appreciating asset base

Illustration of different returns generated under HCA and CCA conventions assuming:

- Enterprise has an allowable return of 10%
- Purchase asset for 1000 on 1 April 1995, with a useful life of 10 years
- Asset is subject to 5% appreciation

Year ended 31 March	1	2	3	4	5	6	7	8	9	10
HCA										
Opening NBV	1,000	900	800	700	600	500	400	300	200	100
Depreciation charge	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)
HCAD	(100)	(200)	(300)	(400)	(500)	(600)	(700)	(800)	(900)	(1,000)
Closing NBV	900	800	700	600	500	400	300	200	100	0
MCE	950	850	750	650	550	450	350	250	150	50
HCA costs (= depreciation)	100	100	100	100	100	100	100	100	100	100
Return	95	85	75	65	55	45	35	25	15	5
Therefore, revenue is:	195	185	175	165	155	145	135	125	115	105
HCA revenues discounted at 10%	195	168	145	124	106	90	76	64	54	45
CCA										
Opening cost	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Inflation at 5%/holding gain	50	53	55	58	61	64	67	70	74	78
Gross replacement cost	1,050	1,103	1,158	1,216	1,276	1,340	1,407	1,477	1,551	1,629
Depreciation charge	(105)	(116)	(127)	(139)	(152)	(166)	(181)	(197)	(214)	(233)
CCAD	(105)	(221)	(347)	(486)	(638)	(804)	(985)	(1,182)	(1,396)	(1,629)
Closing NRC	945	882	810	729	638	536	422	295	155	0
MCE	973	914	846	770	684	587	479	359	225	78
Costs (= depreciation)	105	116	127	139	152	166	181	197	214	233
Return	97	91	85	77	68	59	48	36	23	8
Holding gain	(50)	(53)	(55)	(58)	(61)	(64)	(67)	(70)	(74)	(78)
Therefore, revenue is:	152	154	156	158	160	161	162	163	163	163
CCA revenues discounted at 10%	152	140	129	119	109	100	91	83	76	69
Discount factor	**1.00**	**1.10**	**1.21**	**1.33**	**1.46**	**1.61**	**1.77**	**1.95**	**2.14**	**2.36**
Aggregated discounted revenues under HCA										**1066***
Aggregated discounted revenues under CCA										**1069***

* Numbers may not be equivalent due to rounding

B Example methodology – falling asset base

Illustration of different returns generated under HCA and CCA conventions assuming:

- Enterprise has an allowable return of 10%
- Purchase asset for 1000 on 1 April 1995, with a useful life of 10 years
- Asset is subject to 5% depreciation

Year ended 31 March	1	2	3	4	5	6	7	8	9	10
HCA										
Opening NBV	1,000	900	800	700	600	500	400	300	200	100
Depreciation charge	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)
HCAD	(100)	(200)	(300)	(400)	(500)	(600)	(700)	(800)	(900)	(1,000)
Closing NBV	900	800	700	600	500	400	300	200	100	0
MCE	950	850	750	650	550	450	350	250	150	50
Return	95	85	75	65	55	45	35	25	15	5
Costs (= depreciation)	100	100	100	100	100	100	100	100	100	100
Return	95	85	75	65	55	45	35	25	15	5
Therefore, revenue is:	195	185	175	165	155	145	135	125	115	105
HCA revenues discounted at 10%	195	168	145	124	106	90	76	64	54	45
CCA										
Opening cost	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Holding (loss)/gain	(50)	(48)	(45)	(43)	(41)	(39)	(37)	(35)	(33)	(32)
Gross replacement cost	950	903	857	815	774	735	698	663	630	599
Depreciation charge	(95)	(86)	(77)	(69)	(61)	(54)	(48)	(42)	(36)	(32)
CCAD	(95)	(181)	(257)	(326)	(387)	(441)	(489)	(531)	(567)	(599)
Closing NRC	855	722	600	489	387	294	210	133	63	0
MCE	928	789	661	544	438	340	252	171	98	32
Return	93	79	66	54	44	34	25	17	10	3
Costs (= depreciation)	95	86	77	69	61	54	48	42	36	32
Return	93	79	66	54	44	34	25	17	10	3
Holding gain	50	48	45	43	41	39	37	35	33	32
Therefore, revenue is:	238	212	188	166	146	127	110	94	79	66
CCA revenues discounted at 10%	238	193	155	125	99	79	62	48	37	28
Discount factor	**1.00**	**1.10**	**1.21**	**1.33**	**1.46**	**1.61**	**1.77**	**1.95**	**2.14**	**2.36**
Aggregated discounted revenues under HCA										**1066***
Aggregated discounted revenues under CCA										**1064***

* Numbers may not be equivalent due to rounding

C Example methodology – impact of changing asset prices after the change from HCA to CCA has occurred

Illustration of different returns generated under HCA and CCA conventions assuming:

- Enterprise has allowable return of 10%
- Purchase asset for 1000 on 1 April 1995, with a useful life of 10 years
- Asset is subject to 5% appreciation
- The conversion from HCA to CCA happens at the end of 1997

Year ended 31 March	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
HCA										
Opening NBV	1,000	900	800	700	600	500	400	300	200	100
Depreciation charge	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)
HCAD	(100)	(200)	(300)	(400)	(500)	(600)	(700)	(800)	(900)	(1,000)
Closing NBV	900	800	700	600	500	400	300	200	100	0
MCE	950	850	750	650	550	450	350	250	150	50
Return	95	85	75	65	55	45	35	25	15	5
Costs (= depreciation)	100	100	100	100	100	100	100	100	100	100
Return	95	85	75	65	55	45	35	25	15	5
Therefore, revenue is:	195	185	175	165	155	145	135	125	115	105
HCA revenues discounted at 10%	195	168	145	124	106	90	76	64	54	45
CCA										
Opening Cost	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Holding gain / (loss)	50	53	55	58	61	64	67	70	74	78
Gross replacement cost	1,050	1,103	1,158	1,216	1,277	1,341	1,408	1,478	1,552	1,630
Depreciation charge	(105)	(116)	(127)	(139)	(152)	(166)	(181)	(197)	(214)	(233)
CCAD	(105)	(221)	(347)	(486)	(638)	(804)	(985)	(1,182)	(1,397)	(1,630)
Closing NRC	945	882	810	730	638	536	422	296	155	0
MCE	973	914	846	770	684	587	479	359	225	78
Return	97	91	85	77	68	59	48	36	23	8
Costs (= depreciation)	105	116	127	139	152	166	181	197	214	233
Return	97	91	85	77	68	59	48	36	23	8
Holding gain/ inflation	(50)	(53)	(55)	(58)	(61)	(64)	(67)	(70)	(74)	(78)
Therefore, revenue is:	152	154	156	158	160	161	162	163	163	163
CCA revenues discounted at 10%	152	140	129	119	109	100	91	83	76	69
Discount factor	**1.00**	**1.10**	**1.21**	**1.33**	**1.46**	**1.61**	**1.77**	**1.95**	**2.14**	**2.36**

Note: ■ *Highlighted figures have not been included in the calculation of the windfall and are only presented for comparison.*

The sum of the discounted revenues earned over the period, assuming a switch between the two methodologies at the end of 1997 equals: 1555.*

* Numbers may not be equivalent due to rounding

Illustration of different returns generated under HCA and CCA conventions assume:

- Enterprise has allowable return of 10%
- Purchase asset for 1000 on 1 April 1995, with a useful life of 10 years
- Asset is subject to 5% appreciation up until the switch and random thereafter
- The conversion from HCA to CCA happens at the end of 1997

Year ended 31 March	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
HCA										
Opening NBV	1,000	900	800	700	600	500	400	300	200	100
Depreciation charge	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)
HCAD	(100)	(200)	(300)	(400)	(500)	(600)	(700)	(800)	(900)	(1,000)
Closing NBV	900	800	700	600	500	400	300	200	100	0
MCE	950	850	750	650	550	450	350	250	150	50
Return	95	85	75	65	55	45	35	25	15	5
Costs (= depreciation)	100	100	100	100	100	100	100	100	100	100
Return	95	85	75	65	55	45	35	25	15	5
Therefore, revenue is:	195	185	175	165	155	145	135	125	115	105
HCA revenues discounted at 10%	195	168	145	124	106	90	76	64	54	45
CCA										
Opening Cost	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Holding gain / (loss)	50	53	55	58	(100)	(100)	100	100	(50)	100
Gross replacement cost	1,050	1,103	1,158	1,216	1,116	1,016	1,116	1,216	1,166	1,266
Depreciation charge	(105)	(116)	(127)	(139)	(72)	(52)	(172)	(192)	(77)	(217)
CCAD	(105)	(221)	(347)	(486)	(558)	(610)	(781)	(973)	(1,049)	(1,266)
Closing NRC	945	882	810	730	558	406	335	243	117	0
MCE	973	914	846	770	644	482	371	289	180	58
Return	97	91	85	77	64	48	37	29	18	6
Costs (= depreciation)	105	116	127	139	72	52	172	192	77	217
Return	97	91	85	77	64	48	37	29	18	6
Holding gain/ inflation	(50)	(53)	(55)	(58)	100	100	(100)	(100)	50	(100)
Therefore, revenue is:	152	154	156	158	236	200	109	121	145	122
CCA revenues discounted at 10%	152	140	129	119	161	124	61	62	67	52
Discount factor	**1.00**	**1.10**	**1.21**	**1.33**	**1.46**	**1.61**	**1.77**	**1.95**	**2.14**	**2.36**

Note: Highlighted figures have not been included in the calculation of the windfall and are only presented for comparison.

The sum of the discounted revenues earned over the period, assuming a switch between the two methodologies at the end of 1997 equals: 1554*

* Numbers may not be equivalent due to rounding

Sir Bryan Carsberg

Clive Ansell
Group Strategy Director
British Telecommunications plc
BT Centre
81 Newgate Street
London
EC1A 7AJ

10 February 2005

Dear Clive

Valuing Copper Access – an Assessment of the Ofcom Consultation Paper

KPMG have been commissioned to prepare a report on Ofcom's above-named consultation and I have been an advisor to KPMG in relation to the project. This letter confirms that I am in agreement with the conclusions of KPMG's report.

In addition, I will be writing to Ofcom separately summarising the key issues, with a view to meeting them in the near future.

Yours sincerely

pp Bryan Carsberg

cc Anne Heal, Director Regulatory Affairs
cc Tim Jones, Head of Regulatory Reporting

VALUING COPPER ACCESS: A CONSULTATION ON PRINCIPLES

Comment by Dr Eileen Marshall CBE

1. Introduction

Ofcom has concluded that much of BT`s copper access network is non-contestable (a natural monopoly) and that, for the foreseeable future, this situation is likely to remain. As part of its strategic review of telecommunications, Ofcom is considering the appropriate approach to regulation of the current generation copper access network and sees the present consultation on how best to value the network assets as part of that review: the results are expected to feed into a number of price controls and price determinations.

In its consultation document, Ofcom has indicated that its preferred approach to asset valuation is to continue the present system, based on current cost accounting (CCA), though it may wish to revise the basis of the calculations.

The purpose of this document is to analyse the use of CCA information in the context of UK utility regulation and to suggest that Ofcom adopt a different approach to valuing BT`s copper access network assets, by establishing a regulatory value (RV) related to market information concerning shareholders' reasonable expectations and interests which is then incorporated into a cash flow approach to price setting.

This 'market valuation' approach to setting a RV has been widely used by UK utility regulators and supported by regulatory economists and accountants and by the former

Monopolies and Mergers Commission (MMC)[1]. Important contributions on changing from setting price controls using a CCA valuation to adoption of a market-related regulatory value (RV), which was then fully incorporated in a Net Present Value (NPV) analysis (see below), came in the discussions between Ofgas and British Gas in the period preceding an MMC investigation and then in the MMC`s 1997 report on the pipeline and storage activities of British Gas.

2. The Principles of UK Utility Regulation

Ofcom has said in its consultation document that it wishes to concentrate initially on the principles that should be adopted in valuing BT`s copper access network: clearly these principles need to be consistent with the wider principles of UK utility regulation.

It is well-known that, before privatisation of the utilities, starting in the 1980s, utility regulation had developed a bad name among economists. In the United States, a `rate of return' regulatory regime gave incentives for `gold-plating' by incumbents. It was different from state ownership, which was the means by which British governments regulated `key' industries from the 1940s onwards, but it seemed little better. Both forms of regulation appeared to encourage inefficient producer-led industries.

The economics underlying nationalisation assumed all-knowing governments that would seek to replicate the outcomes of perfectly competitive markets in the running of the industries. Such analysis, based on idealised equilibrium models, ignores the real world where governments with multiple objectives will not always pursue industry efficiency as a primary and consistent objective. Moreover, it also fails to recognise that even the most

[1] Now the Competition Commission

altruistic government/nationalised industry management could not possess the information needed to replicate the outcomes of competitive markets, since it is competition that creates the information which both businesses and governments have to use in order to drive forward efficiency and innovation. Regulation under nationalisation, which was a form of central planning, lacked objective information revealed though market processes and was necessarily subjective with outcomes, as studies showed, far from the ideal its originators envisaged.

A specific example of this occurred in the 1960s. No guidelines on pricing policy were given to the nationalised industries until a 1967 White Paper responded to the criticisms of economists and explicitly urged the adoption of long run marginal cost pricing. However, no specific guidance was issued as to how this might be done in practice and no penalties were set out for non-compliance. In any case, information used by the industries to calculate the prices would be specific to the industry concerned, making it very difficult for the Treasury or sponsoring departments to set up effective monitoring. The upshot was widespread disregard of the pricing guidelines, whilst those industries that did try to implement them found that they had to make speculative, highly subjective guesses about a very uncertain future[2].

Meanwhile, studies on the outcome of rate of return regulation in the United States showed that the managements of natural monopolies, if not appropriately incentivised to seek outcomes which increase the efficiency of their businesses, are likely instead to try to make increased profits by influencing the regulatory regime rather than by earning

them through innovation. In general, both UK nationalisation and US rate of return regulation overlooked the role that profit-seeking plays in competitive markets, incentivising entrepreneurial firms to search for better ways to meet customers` demands, thereby revealing new information on costs and innovation, with competitive rivalry subsequently competing away these profits, all to the ultimate benefit of consumers.

The new UK model of regulation, initiated with the privatisation of BT in 1984, has proved more successful than either the old US regime or nationalisation because of its novel features, including the establishment of regulators independent of the day-to-day political process [3], the promotion of competition and incentive regulation of monopolies.

Successful regulation within this framework, however, still needs to be practised with due regard to the real world informational limits with which the regulator and the regulated businesses are faced and with a clear understanding of how crucial are appropriate incentives to encourage innovation and efficiency in both non-contestable and contestable markets. For example, in promoting competition, regulators do not have the information to `pick winners' among different types of competition, so efforts are best directed at removing economic barriers to the development of competition rather than biasing the regime in any particular direction. Moreover, overtight regulation of potentially competitive activities can have the unintended consequence of thwarting the development of competition itself. Elsewhere in its Telecommunications Strategic Review (TSR), Ofcom appears to support pro-competition regulation consistent with these principles by

[2] The guidelines were later withdrawn

suggesting more rigorous regulation to ensure equality of access for network users and the subsequent deregulation of downstream markets.

In similar fashion, the `lighter touch' incentive regulation of natural monopolies is intended to avoid, and must in practice avoid `micromanagement' by ill-informed regulators, providing instead an incentive within the price control itself to motivate utility managers to improve the efficiency of their operations. The incentive comes, first, from the forward-looking targeting of revenues for a period ahead sufficient to give inducements to companies to better the targets set by the regulator: the targets themselves are based on the regulator`s evaluation of the regulated business`s efficient forward-looking expenditures over the chosen period. A key to the effectiveness of this incentive is that, while expected increases in efficiency are taken into account by the regulator when setting the price control, any unanticipated gains made during the initial period must be kept by the company and not `clawed back' by the regulator in subsequent price control reviews[4]. Then the new information revealed through the operation of the efficiency incentive can be taken into account in setting the next price control so that consumers too benefit, after a modest lag, from the regulatory incentive that initially benefits shareholders (thereby mimicking the profit creation and dispersal and information-revealing properties of the competitive process). If the `no clawback' principle is not fully appreciated and practised, the approach collapses towards a form of cost-plus regulation based on highly detailed, ex post auditing to determine disallowed gains.

[3] Thereby helping to give investors in the newly-privatised utilities confidence that the industries would not be used to further the government`s macroeconomic objectives, as had happened under nationalisation.

But it is also crucial, when regulating networks characterised by long-term committed investments, to give proper incentives to investors by making sure that they are reasonably rewarded. It might be argued that it is only necessary to ensure that investors have confidence that their forward-looking efficiently-incurred costs will be funded at the appropriate cost of capital. But a workable incentive system cannot be entirely forward looking. Shareholders will justifiably argue that they have funds already committed up to the present that need to be rewarded. If a regulator acted in an arbitrary fashion to reduce significantly shareholders` capital values, it could worsen the terms on which funds were available and possibly deter investment, thereby harming the interests of consumers in the long run. To ensure a regulated business continues to be willing to incur efficient capital expenditures, the principle of `no clawback' needs to be applied to past efficiently-incurred investment as well as to future expenditures. Moreover, the determination of what expenditure is and is not efficiently incurred must also recognise the limitations that face the regulated business as well as the regulator when making decisions: thus the regulator should strictly adhere also to the rule of `no hindsight' in judging the efficiency of capital investment, as part of the implementation of the `no clawback' principle.

If a regulator reneges on the commitment to treat shareholders reasonably, the negative effects on future capital investment could spread further than the regulated firm. The regulator`s action might influence other potential investors in the industry and possibly other regulated sectors, through the continual re-evaluation of risks and rewards and the

[4] Of course, similar rules apply to unanticipated losses

cross-referencing that occurs in capital markets. In these circumstances, arbitrary regulatory action could adversely affect investment and consumer interests in other parts of the telecommunications industry and other regulated sectors.

3. CCA and incentive regulation

In its consultation document Ofcom has indicated a preliminary preference for the continued use of CCA to value BT`s copper access network, with various suggestions as to how such an exercise might be approached. However, Ofcom also says that its main concern at present is to consider, as a matter of principle, whether CCA or other methods should be used for the copper access valuation. The issue of principle, in relation to the use of CCA, is addressed in this section.

There are two main problems with using CCA valuations for regulatory purposes. The first is that, on flotation, stock market values for some of the privatised utilities, for example the water companies and British Gas, were significantly below the replacement cost value of the assets. If investors were then rewarded on the basis of replacement cost book values, the outcome could be seen as unfairly favouring shareholders at the expense of customers, which in turn could introduce uncertainty into the regulatory regime because of the expectation that such a state of affairs would need to be corrected at some future time. In the industries concerned this problem has been dealt with by incorporating, instead of the CCA valuation, a RV based on information from capital markets to represent shareholders` interests and on which future returns are based.

However, even where a privatisation discount to book value is not an issue, such as with BT, there are practical problems associated with the use of CCA valuations in setting price controls.

The case made for using CCA valuations is that, in principle, economic efficiency is assured by prices that reflect costs so that the prices of a network monopoly should reflect the current costs of its asset base. There is lengthy discussion in the literature about how precisely CCA values should be calculated. But if, for example, the calculation was to be based on some variant of the principle of modern equivalent assets (MEA) it would be necessary to recognise that, since it is likely that a network will have been created in a piecemeal way over a long period of time, a new system would probably comprise a quite different configuration from that inherited from the past. In this case then, the MEA approach values the hypothetical new system on the grounds that it is the lowest cost way of providing the services, and if the owners of the current assets are rewarded on a higher valuation then it will be efficient for a new system to replace the old.

Such an approach to asset valuation necessarily involves a very large element of subjectivity, if only because the optimal system to build today depends on long term projected costs and demand movements. Thus there is substantial scope for error and the resulting `real' economic prices are likely to be far from real. In effect, the problem is the same as that faced by central planners under nationalisation. Moreover, the subjectivity of such calculations means that there is considerable room for manipulation. Company

management, regulated on such a basis, would have an incentive to seek to overstate assets to increase shareholder returns, whilst similarly subjective calculations by a regulator could be used to rationalise the choice of a particular policy initiative.

If a company is in competition with rivals, it can be expected to carry out financial project analysis to help determine whether it can expect to fund all future costs at the company`s cost of capital. But, once in business, the extent to which the expectations of shareholders are met will depend on the outcome of the competitive process, including the costs of new rivals. In such circumstances, business practice might reasonably include evaluation of movements in `modern equivalent assets', for example, to inform price setting. However, this is not the situation facing a regulator or company when dealing with a natural monopoly. If the activities are deemed non-contestable, by definition there is no competitive test of the worth of such assets: instead, using CCA justifications, the value of the assets can effectively be determined by what the regulator subjectively decides they are worth. This means that, while in contestable activities the return on shareholders` investments is an **output** resulting from actual costs and revenues within market transactions, in non-contestable activities regulators can, in effect, mandate the return to shareholders as an **input** based on highly subjective CCA valuations. Regulators have an understandable wish to justify the return given to shareholders by reference to an objective measure. Suffice to say that any such attempt to create an objective CCA `value' is doomed to failure[5].

[5] Similarly, in setting price controls in contestable activities which have a large retail element and relatively few capital assets, CCA asset valuations are not very helpful.

There is a further significant disadvantage to the use of CCA calculations in price control setting, which is that if there is an allowance in the new price control to reflect the CCA depreciation provisions, it can cloak critical examination of future capital expenditures and trade-offs between future operating and capital costs. Whilst the comparisons underlying asset valuation methods may be useful in so far as they could help to clarify the major choices facing the regulated business, they should not obscure one of the principal advantages of the forward-looking approach to price setting which is inherent in incentive regulation – namely, the critical evaluation of when and with what alternatives the present network will have to be modified and/or replaced. To bury this issue in the assumptions made in the asset valuation procedure (that is, CCA asset valuation accompanied by CCA depreciation) risks ignoring the need to enquire into the real options facing utility managements and their critical review by regulators.

The careful evaluation of the capital expenditure options actually facing a regulated business helps the regulator to protect consumers by setting prices/revenues according to forward-looking efficient expenditures. But such evaluations can also help shareholders of the regulated business by determining ex ante what will be deemed by the regulator as efficiently-incurred expenditures, making any later ex post revisions less likely and more explicit if they do occur, rather than being hidden within revised CCA calculations.

In the Foreword to its phase 2 Strategic Review consultation document, Ofcom commendably acknowledges that `regulators cannot create investment, nor are they well placed to determine when and how much. That is for the industry and the market.' Yet, in

seeking to set a CCA valuation of BT`s assets (which will then need to be periodically reset), Ofcom is attempting another very similar task that it is not possible for the regulator to perform objectively.

The implications of the above analysis are that, if CCA is used to value network assets for regulatory purposes, even the most well-intentioned regulator could call forth unintended consequences that could compromise incentive regulation and hence ultimately harm the interests of consumers which the regulator is seeking to serve, especially in a market as dynamic as UK telecommunications. In summary, these unintended consequences could include the following.

First, it could amount to expropriation of what, in the real world and without hindsight, would otherwise be seen as efficiently-incurred investments on which shareholders could reasonably be expected to be rewarded. Such an outcome could obviously seriously compromise the incentive for the regulated firm to invest efficiently in the future and could, as a consequence, harm consumers. Second, it could create arbitrariness in the setting of average network prices, for example reducing them in one price period and raising them in the next on the basis of subjective CCA re-evaluation.

Third, it could have consequences indirectly for future (and current) infrastructure providers who would expect to cover their forward-looking costs and to compare those with BT`s real future outlays in determining whether to build or not. The (arbitrary) revaluation of BT`s assets according to CCA valuations (a method that would presumably

be used to value all BT`s network assets, not just its copper access network) could thus create uncertainty and hamper entry which in turn could bias choices between infrastructure and service competition.

Fourth, as noted above, such an approach can detract from the proper scrutiny of the regulated business`s corporate plans for forward-looking capital expenditures, including trade-offs with operating expenditures. This is a key part of the regulator`s task, in order to set allowed revenues on the basis of realistic projections and anticipated efficiencies, and can also help establish ex ante what the regulated business can reasonably expect to be counted by the regulator as efficiently-incurred capital investment, thereby forming part of a comprehensive incentive regime.

4. A cash flow approach to price control setting

In order to accommodate the fact that total allowed revenues must include allowances for both forward-looking efficient costs and investors` reasonable expectations and interests, regulatory practice in setting network price controls has developed to include two main elements. The first element, as indicated above, comprises a calculation of an allowed revenue stream for a period of years ahead in which the Net Present Value (NPV) of future revenues is set equal to the NPV of an efficient level of forward-looking capital

and operating expenditures with both costs and revenues being discounted at the relevant cost of capital[6].

In estimating the second element in the price control calculation, the amount that can reasonably be included in allowed revenues to represent shareholders` interests, it is necessary to determine an appropriate valuation of the shareholders` interest on which the cost of capital will be paid.

Setting an appropriate valuation is a difficult judgment for regulators to make, since in the short term at least it amounts to a zero-sum game – consumers can benefit if shareholders get less (and vice versa). Thus it is reasonable for regulators to seek to determine the return given to shareholders by reference to an objective measure. But, as discussed above, trying to use ever-changing CCA calculations for this purpose is doomed to failure.

Several regulators and the MMC have looked instead to capital market values, rather than accounting data, to establish an initial `market value' (IMV) which is then rolled forward in a predictable way to provide opening and closing RVs in respect of each price control period, as discussed below. The rationale for using capital market information is that it more accurately reflects the `true' value of the utilities` assets, being investors` view of the NPV of the future revenues they would be able to earn, in excess of operating costs and discounted at the company`s future cost of capital.

[6] The speed at which any revealed unanticipated efficiency gains will subsequently be passed on to consumers will also need to be accommodated at this stage, with any `glide path' towards revealed efficient

Most commentators consider that if this approach is to be used it is preferable to derive the IMV at or close to flotation, as being less vulnerable to the criticism of circularity than a later date. The circularity arises because, by establishing a RV the regulator can be seen as making explicit an aspect of the `regulatory contract' between the company and the regulator which the regulator`s actions can appreciably influence: the market value at or close to flotation would have been largely based on prospectus information rather than on expectations formed when the regulatory regime was in operation and hence could be argued as being more `objective'.

When a market-based RV was used in resetting the early post-privatisation price controls – such as with the regional electricity companies and the water companies – IMVs at or near flotation **were** used. However, this approach has not been universally adopted. With regard to British Gas, where the move from using CCA information in setting price controls to the establishment of a market-based RV took place in 1997, over 10 years after privatisation, the date used for establishing the IMV was December 1991: the date was that chosen by the MMC, in its 1993 report, when it was seeking a cost of capital that could be applied to both `existing' (pre-privatisation) and new assets and was subsequently used by Ofgas when setting the 1997 price control for BG`s transportation and storage activities. By December 1991 the market value of British Gas had risen considerably relative to book values so that adopting an IMV some five years after privatisation was relatively generous compared with using a figure at or close to flotation.

---

levels being incorporated within the expenditure streams.

In the case of BT, given the length of time since privatisation, market values at or close to privatisation will be largely irrelevant. On the other hand, there is a history of previous regulatory settlements which, together with capital market responses to those settlements, could provide the basis for assessment of shareholders' reasonable expectations and interests.

It is clear that establishing IMVs from capital market information is not an exact science and the date chosen for determining the initial value could vary, in practice, from flotation up to the start of a price control currently under review. Making use of capital market information, whilst helpful, cannot completely absolve the regulator from making judgments when determining the IMV. It is particularly important, therefore, to bear in mind the key principles to be observed. The **purpose** of setting such a value is to recognise explicitly, when setting price controls, the reasonable expectations and interests of shareholders in network natural monopolies with large committed investment, whilst the **basis** used for setting it should strike an acceptable balance between the interests of shareholders and consumers. Moreover, it is essential that the setting of an IMV by a regulator is a `one-off', to minimise issues of circularity.

Since capital market information can only be observed directly for a quoted company, in the British Gas case, assumptions had to be made about how the company IMV was to be divided between its different businesses. There are two principal methods of apportionment which have come to be known as the `focussed' and `unfocussed' approaches. In the focussed approach, estimates are made of the extent to which the

market value of each business may be at a discount (or premium) to its net book value. In the unfocussed approach, a working assumption is used that all assets are valued by the market on a pro-rata basis to book value. In the absence of firm evidence of the value placed by the market on any one or more parts of the business, any attempt to adopt a focussed approach to the initial market valuation of the regulated business will contain a subjective element. However, the adoption of a focussed approach enables the value imputed to contestable activities to approximate their market values.

In BT`s case, given the mix between non-contestable and contestable businesses and the dynamic nature of many of the businesses, the focussed approach is likely to be the more appropriate. Once again, deriving an initial RV on this basis for BT`s network, and specifically the copper access assets, inevitably involves some subjectivity. However, there is a 20 year history of capital market evaluations of BT and these evaluations will have examined its different parts. Thus, although there is one share price, there is good information as to assessments of how that value is built up from components of the business overall, subject to the usual approximations and uncertainties.

If the date for setting the IMV differs from the date set for the start of the next price control, then having established an IMV for the regulated business, that value has to be rolled forward to the start of the proposed new price control to determine the opening RV, and then rolled forward again to establish a closing RV. This entails adding to the IMV subsequent net capital expenditure and deciding on the index to use for revaluing assets through time. An important economic principle in establishing the basis for rolling

forward the RV, consistent with incentive regulation, is that the roll-forward method should not of itself allow the regulated business`s internal rate of return on the regulatory value of its assets to differ from its cost of capital[7]. On this basis, in rolling forward the RV from the date the IMV was determined to the opening of the price control, and then on to a closing RV at the end of the price control period, the actual amount of depreciation allowed should be deducted from the IMV and all subsequent efficiently-incurred capital expenditures added to it.

In rolling forward the RV in real terms, there is a choice between using an asset-specific price index and a general price index such as the retail price index (RPI). In making the choice, there is a need for consistency between the basis for estimating the regulated business`s cost of capital and the method of calculating the RV. For example, if assets are revalued for regulatory purposes using CCA, then to the extent that the real cost of capital replacement is expected to decline (or increase), setting allowed revenue on the basis of a return equal to the business`s cost of capital on forecast net book values will, of itself, mean that the internal rate of return on new investment will be less (or more) than the business`s cost of capital. In principle, the change to shareholders` funds which results from real changes in the costs of asset replacement could be compensated either through allowing a higher (or lower) rate of return. But an alternative is to use a method of indexing the RV that ignores the cost of replacement. Revaluing for regulatory purposes in line with changes in the RPI achieves this. The real fall or rise in the cost of capital

[7] However if, as would be the case for BT, previous price controls had been set on the basis of CCA valuations, careful consideration needs to be given to the roll-forward method used to establish the opening RV to ensure the principle of no clawback is upheld.

goods used by a regulated company should then be reflected in the cash flow projections themselves.

The RPI method of indexation of the RV also has the advantage of being independent of the regulatory process. It thus removes the subjectivity associated with the regulator`s making an estimate of future trends in the cost of asset replacement and avoids any incentive for the regulated business to use the lack of transparency and the subjectivity involved in constructing a specific price index to seek to bias the valuation to its own advantage. The benefits of using RPI indexation have led to its being the preferred choice of utility regulators, being used, for example, by the water, electricity and gas regulators and supported by the MMC.

In summary, the use of the `cash flow' method outlined above to provide a reasonable reward for investors when setting price controls requires the calculation of an opening RV to be incorporated into a NPV appraisal. Establishing the opening RV includes the following steps:

a) the establishment of an IMV representing an amount of future revenue in present value terms which shareholders of the regulated business can expect to receive in recognition of past investments;
b) the rolling forward of that value whereby over time the amount of all new efficiently-incurred capital expenditure is added to the RV, whilst contributions raised from the network users to repay investment (the `depreciation' charges) are

deducted from it – the outcome of these two adjustments giving the valuation of the shareholders` interest in the price-controlled business at any given time; and

c) the indexing of the RV, using an RPI index, to ensure its real value is maintained.

In practice, two further issues need to be addressed when determining the cash to be included in allowed priced control revenues deriving from the opening RV. The first is the **period** over which the revenues representing the RV are to be profiled (for example, over the working lives of the underlying assets), and the second is what revenue **profile** to adopt over the chosen repayment period[8]. Whatever the chosen repayment period and revenue profile, the opening RV which is incorporated into the NPV (cash flow) analysis at the start of the price control period and the closing RV which is established for the end of that period, represent the NPV of shareholders` interests in subsequent years in respect of existing underlying assets.

The practice of incentive regulation, using the economic cash flow method outlined above (which combines a critical examination of future capital and operating expenditures and the establishment of a forward-looking incentive for management to better the anticipated efficiency gains, with the adequate remuneration of past efficient investments) limits unnecessary regulatory risk and ensures continuing efficient investment in the future. Thus it has clear benefits for shareholders, network users and their customers. The approach can also be adapted to facilitate the unbundling of contestable activities, it can give users of a regulated network an assurance that future

operating and capital expenditures will be properly scrutinised, and it can give infrastructure competitors a more reliable comparison on which to base their own investment decisions.

5. Application of the cash flow approach to BT

Elsewhere in its TSR, Ofcom comes to the preliminary conclusion that true equality of access to BT`s network, as between BT`s own retail business and its competitors, requires strict ring fencing to separate BT`s contestable and its non-contestable activities, better to promote competition. In these conclusions, it is shadowing experience in the energy utilities and particularly in gas[9]. It is, therefore, likely that Ofcom like Ofgas will wish to consider setting price controls on a similar stand-alone basis, to prevent any attempt to shift costs from contestable to non-contestable activities and to enable the differing levels of risks in the businesses to be recognised in separate cost of capital calculations. A cost-reflective structure of charges can then be calculated to recover the price-controlled revenues, which can be charged to **all** network users, including BT itself. Such an exercise can complement the pro-competitive ring fencing that Ofcom is proposing and facilitate the eventual deregulation of contestable activities that Ofcom also envisages. Thus, although the valuation exercise required is somewhat different from

[8] It has long been recognized that the goal of fairly reimbursing investors for the capital investment can be accomplished using any repayment profile, so long as a rate of return equal to the cost of capital is paid on the outstanding investment.

[9] After numerous, only partly successful regulatory interventions to promote competition, the MMC concluded in its 1993 gas report that BG`s dual role as both a seller of gas and owner of the transportation system that its competitors had no alternative but to use gave rise to "… an inherent conflict of interest

that contemplated under CCA - it would focus on market information rather than a paper-based valuation of a hypothetical optimised network – and although it would create some additional tasks, it is unlikely to increase today`s regulatory workload overall, and could be expected to reduce workload in future periods. This follows from reductions in the requirements for future `hypothetical optimisation' exercises.

More important, for Ofcom its TSR offers an opportunity to reassess its approach to network regulation, taking into account `best practice' within other regulated sectors in the UK. The basis on which the valuation of BT`s copper access network is approached is a necessary first step to change track towards the adoption of an approach that reduces unnecessary regulatory risk and better serves consumers` interests. Setting the initial RV of the copper access network is about settling with shareholders on reasonable terms vis-a-vis consumers (not valuing hypothetical optimised networks that will never be built). Therefore a better means of determining the RV, as outlined above, would be to look to the capital market for information, taking into account that market expectations will themselves have been grounded in past regulatory settlements. On this basis, the values currently in the regulatory accounts remain of relevance. They can provide a base estimate for the valuation, but it will then be necessary to assess whether implied focussed capital market values for the component businesses stand at substantial premiums or discounts to regulatory book values.

---

which makes it impossible to provide the necessary conditions for self-sustaining competition." (MMC 1993).

As mentioned above, although this is a different exercise from the one Ofcom is presently contemplating, it will probably require no more resource input now and will almost certainly save resources in future, as it is a `one-off' exercise, with the RV thereafter being rolled forward against established regulatory principles.

6. Summary and Conclusions

Incentive regulation of utility networks formed an important part of the new approach to regulation which was adopted in the UK when the utilities were privatised, and which took account of the lessons learned from past regulatory failures in the UK and the US. It is based on setting in place a workable incentive scheme for regulated businesses to encourage them to seek out profitable opportunities from innovation, with the new information created through that process being taken into account by the regulator in setting subsequent price controls.

The new regime thus benefits both shareholders and consumers. One of the implications of such incentive regulation is that determining a price control is an exercise in formulating and assessing a financial project, just as in the assessment of any business project. The initial step is to set revenues to match present values of efficient levels of future capital and operating costs discounted at the relevant cost of capital, with any unanticipated efficiency gains initially retained by shareholders (who would also bear any unanticipated losses).

However, for capital intensive networks, it is not sufficient for the incentive to be wholly forward looking. A regulator, seeking to set prices towards levels indicated by future financing requirements alone, without reference to the shareholders` existing position, would be ignoring how incentives work in practice and, in the process, harming the interests of consumers.

Determining the basis of a reasonable settlement for shareholders` past investment necessarily involves regulators in making judgments between consumers and shareholders. In the short term, the regulator could determine the return to shareholders by favouring consumers at the expense of shareholders. But this would be a short-sighted approach, which could raise the cost of capital for the regulated business and possibly deter investment, to the ultimate cost of the consumer.

In the difficult task of properly balancing the interests of shareholders and consumers, it is understandable for regulators to seek some `objective' measure as the basis for such a valuation. But the CCA approach contemplated is not an objective option: it is necessarily subjective and speculative. The regulator must rely on his or her own assessment of the long term future through the exercise of evaluating a hypothetical optimised network, since no market test is available to guide such an evaluation in a natural monopoly network. The approach has been tried in the past (under nationalisation) and the record is poor.

There is, in practice, no completely objective way of determining a value to represent investors` past expectations and interests. However, there is a more objective way forward, based on the `one-off' estimating of an initial regulatory settlement with investors (IMV) and subsequent medium term assessments of (expected actual, not as in CCA, hypothetical optimised) operating and capital expenditures when price controls are reviewed: the RV is rolled forward on the basis of net capital expenditures (new efficiently-incurred investment minus actual depreciation), indexed using the RPI. This approach has been widely applied by other UK sectoral regulators for many years, and it continues to be considered best practice by those regulators.

Although the valuation exercise is somewhat different from that required under CCA – it would focus on market information rather than a paper-based valuation and it would create different tasks – it is unlikely to bring a net increase in today`s regulatory workload and it could be expected to reduce future workloads.

Most important, it has major advantages for the regulated businesses, competitors and consumers, because it would help to increase efficiency and to reduce regulatory uncertainty. Specifically, regulatory evaluations of the scale of future funding to be allowed would be firmly based on

a) actual likely future expenditures (not CCA depreciation), and

b) the one-off incorporation of an RV using market evaluations, rolled forward against established regulatory principles, which would maintain shareholders` financial capital.

The resulting incentive scheme would be backward-looking as well as forward-looking - in that it would properly recognise shareholders` reasonable expectations and interests within a clearly upheld principle of `no clawback' and would work to the long-run advantage of consumers.