Annex E: Report by BT on Ofcom's approach to setting efficiency targets

BT's Response to the June 2015 LLCC Consultation: Questions 6.3 and 7.3 on efficiency assumptions

1. This annex focuses on aspects of Ofcom's efficiency assessment common to both TI and Ethernet services, and should be read alongside our main response. Our response is supported by reports we commissioned from Deloitte[1] and FTI[2], both of which are provided as Annexes to our main response. Subsequent references to Deloitte and FTI in this Annex refer to these two reports unless otherwise stated.

Ofcom's approach to assessing efficiency

2. In the LLCC Consultation[3], Ofcom assumes an efficiency of 4% to 7% for both TI and Ethernet services, with a central estimate of 5%. Ofcom's approach to assessing efficiency for the leased lines services has changed considerably in the last three LLCC reviews.

3. In setting the 2009 LLCC[4] Ofcom considered efficiency as being made up of 'catch-up' and 'frontier shift', much like the other UK sector regulators, and assessed each separately. Historical catch-up was excluded from future efficiency considerations, but the current gap compared to the frontier benchmark was expected to be closed during the period of the review, whilst the frontier shift was based on a general productivity trend. Ofcom departed from this approach for the 2013 LLCC[5] and focused on the historical trend analysis for TI services, and internal management accounts for Ethernet services. For the LLCC Consultation, Ofcom focuses on the latter for both TI and Ethernet services. This is fraught with measurement and incentives issues, resulting in an upward bias of the efficiency estimates applied to these services.

4. In Ofcom's cost forecasting model[6], efficiency is captured separately from scale effects (captured through the application of volume changes to cost and asset volume elasticities) and price changes (captured through year-on-year nominal price change assumptions). For TI services, this means that significant reductions in total costs are likely to overshadow any real increases in underlying asset prices or operating costs. As such, there ought to be well-evidenced justifications for assuming that further efficiencies can be achieved in a legacy network, part of which BT will have been well on its way to closure at the end of the charge control in 2019. Similarly for Ethernet services, the large increases in volumes coupled with cost volume elasticities less than one result in sizable reductions in unit costs. Assumptions on asset prices or operating cost inflation are unlikely to change the direction of this unit cost profile. Furthermore, the application of the Modern Equivalent Asset ("MEA") to legacy Ethernet services will increase

[1] Deloitte, BCMR 2015 – Efficiency estimation Review of Ofcom's approach on efficiency estimation. Annex G to BT Response to Ofcom's consultation document "Business Connectivity Market Review: Leased lines charge controls and dark fibre pricing". August 2015.
[2] FTI Consulting, BT Leased Lines: Efficiency benchmarking. Annex H to BT Response to Ofcom's consultation document "Business Connectivity Market Review: Leased lines charge controls and dark fibre pricing". August 2015.
[3] Ofcom, Leased lines charge controls and dark fibre pricing, 2015. Annex 8.
[4] Ofcom, Leased lines charge control Annex, July 2009, Annex 7.
http://stakeholders.ofcom.org.uk/binaries/consultations/llcc/statement/llccannex.pdf
[5] Ofcom, Business Connectivity Market Review Statement, May 2013, Annex 12.
http://stakeholders.ofcom.org.uk/binaries/consultations/business-connectivity/statement/annexes8-17.pdf
[6] Ofcom, LLCC 2015. Annex 6.

the gradient of this path. Ofcom's assessment overstates the potential for efficiency improvements for both TI and Ethernet services.

5. We note that Ofcom also makes a nominal asset price assumption of 0% for all assets except duct and copper.[7] With a small nominal asset price increase and a CPI assumption of 1.9%[8], this means that there is between 0% and 1.9% real asset price reduction in the valuation of the assets used to support both TI and Ethernet services. This is applied in addition to the 5% capex efficiency assumption, and this aggregate 6.8% assumption is unrealistic. Our response to Question 5.3 on input price inflation assumptions covers this in greater detail.

6. Ofcom does not consider the potential for standard errors surrounding each of its assumptions that go into the cost forecasting model. In particular, Ofcom's assessment of BT's outturn performance against its previous forecasts in Annex 5 of the LLCC Consultation assumes that the cost elasticities are a true reflection of underlying costs, such that the residual must therefore be the additional incentive effects over and above the glide path. Compared against the evidence from other UK regulators, Ofcom's approach to assessing efficiency does not make allowances for measurement errors, or even incentive effects, and the level of Ofcom's recent efficiency assumptions is markedly out of line with regulatory best practice.

7. Ofcom does not consider a number of alternative sources of information with regards to total factor productivity for the telecoms sector, across the regulated sectors, and for the UK economy as a whole. This evidence, some estimated over a long time period, shows consistent results that Ofcom omits in its assessment despite its view that this is equivalent to the efficiency measure used in its model.

8. In light of the available evidence, we consider that a more appropriate efficiency range for TI services is 1% to 2%, reflecting a small degree of potential savings for a legacy network over and above the significant reductions already implied by rapidly declining volumes. For Ethernet services a range of 2% to 5% takes into account the rate of general technological progress and some degree of further catch-up compared to best practice, since other drivers for unit cost reductions would come about from the scale economies already assumed in the model, as well as the application of the MEA assumption. We set out our reasons behind this range in our responses to Question 6.3 for Ethernet services and Question 7.3 for TI services of the LLCC Consultation.

9. For the remainder of this Annex we explore the different types of available evidence on efficiency and assess what they would imply if applied to TI and Ethernet services.

Consideration of alternative sources of evidence

10. Ofcom's analysis of efficiency for TI and Ethernet services finds that "*BT's historic and forecast internal management accounting data is likely to be the most relevant evidence*"[9], and defines the efficiency measure used in its forecasting model as being "*a measure of BT's total factor productivity over time*"[10].

[7] Ofcom, LLCC 2015. Paragraph A8.287 and A8.292.
[8] Ofcom, LLCC 2015. Footnote 49.
[9] Ofcom, LLCC 2015. Paragraph A8.243.
[10] Ofcom, LLCC 2015. Paragraph A8.146.

11. Ofcom has previously focused its assessment of efficiency on BT internal data, and no longer places any weight on evidence from benchmarking studies that look at BT as a whole, the telecoms sector or the wider UK economy. Ofcom considers them as being "*not specific*" to the market under consideration even though "*they represent the scope for efficiency improvements for the organisation as a whole*"[11]. Nonetheless, in the two most recent charge control statements Ofcom no longer place any weight on external sources of benchmarking on the basis that they are either "*old and based on data this is now relevant*" or "*appears to (indirectly) contradict BT public statements that… there were potential catch-up efficiency gains which BT expected to realise*".[12]

12. In this Annex we address Ofcom's comments. Ofcom has not considered the existence of a wide range of alternative sources for Total Factor Productivity ("TFP") growth estimates in the LLCC Consultation, even though Ofcom equates the efficiency assumption in its model to TFP. It is appropriate to look at total factor productivity estimates over a long term, and that regardless of the date of the studies, they all produce a consistent range of TFP estimates. Specifically, the results in Table 1 show that a reasonable TFP assumption lies in the range of 0.5% to 3.0%, and this has been consistently measured over a long time period in different studies, for Ofcom, BT and others.

TFP analysis of European fixed line operators

13. As part of the latest work carried out by Deloitte for BT, it has also extended their previous TFP analysis to consider the average total factor productivity growth for BT and eight European fixed line operators, covering data from 2004 to 2014.

14. The approach Deloitte has undertaken is similar to those used by, for example, the Office of National Statistics ("ONS"), when looking at TFP growth for the UK industries or the economy as a whole[13]. The key benefit of such an analysis is that the data requirements are less strict than alternatives, such as those based on econometric methods, and it is possible to carry this out using publicly available information. TFP growth is generated by subtracting a firm's output growth from its input growth, where outputs and inputs are measured using a Tornqvist index. This approach has been considered and used by UK regulators in the past, including Ofcom[14], and has the advantage of taking into account both operating and capital costs, unlike Ofcom's assessment of historic Regulatory Financial Statements ("RFS") operating cost data.

15. Deloitte's estimates of the growth in TFP have been averaged over the time period under consideration for each individual company. As explained in Deloitte's report, an econometric specification to analyse the TFP growth rates which takes into account scale effects does not offer additional insights to the simple averages estimated.

16. Deloitte's results are robust to different sensitivity assumptions, methodologies, and consistently show average TFP growth over the last decade of around 0.5% to 1.25%. Its results indicate that "*across fixed-line, incumbent European telecommunications operators, productivity improvements*

[11] See for example, Annex 12 of the 2013 BCMR Statement.
[12] Ofcom, Fixed Access Market Review Statement, June 2014, Paragraph A16.81.
[13] See for example, ONS publications on multi-factor productivity: http://www.ons.gov.uk/ons/taxonomy/index.html?nscl=Multi-factor+Productivity, as well as examples provided in the Deloitte's report, Section 4.3.
[14] For example, Ofcom adopted this approach for assessing the historic unit cost trend analysis in the 2009 leased lines charge control, and again in 2013. The outputs and inputs have been used previously in NERA's reports for Ofcom. http://stakeholders.ofcom.org.uk/binaries/consultations/charge/annexes/nera.pdf

across recent years have been small"[15]. Although there is volatility in annual productivity growth estimates, this is not dissimilar to assessments of UK-wide TFP analyses. The simple long-term average provides a good estimate of the general trend within the telecommunications industry.

17. We note that Deloitte's results are similar to those obtained by other studies that show that TFP growth has been estimated between 0.5% and 3% in Table 1. We note that TFP can be defined as "*the portion of output not explained by the amount of inputs used in production*"[16]. For the econometric studies referenced below, the time trend captures all factors not explained by the dependent variables, and could therefore be thought of as a measure of TFP.

[15] Deloitte, BCMR Efficiency 2015, Section 4.6.
[16] See, for example, *Diego Comin, Total factor productivity, 2006. New York University and NBER*

Table 1: Summary of TFP results obtained by different studies

Study	*TFP estimate*	*Time period*	*Comments*
Deloitte, 2013[17]	0% in nominal terms	2005 to 2011	Consistent result for different model specifications. Average CPI inflation over this period was 2.9% in the UK and 2.0% for Euro area.
Deloitte, 2011[18]	SFA time trend: 0.6% to 1.0% Econometric TFP: 2.8%	1996 to 2007	
Deloitte, 2010[19]	Standard TFP: 1.0% Econometric TFP: 1.1% to 2.4%		Econometric TFP (extension of NERA analysis)
Deloitte, 2009[20]	SFA time trend: 2.2% TFP indexation: 0.5% Direct TFP estimation: 0% to 1.9%	US LECs: 1996 to 2006 EU operators: 2002 to 2006	Follow up to comments by NERA. SFA and direct TFP estimation based on US LEC data. TFP indexation approach looked at US LECs and 10 European incumbent operators.
KPMG, 2008[21]	2.1% to 2.3%	1987-2006	Analysis of cash operating costs, excluding depreciation. Annual frontier shift based on labour productivity figures from UK economy sourced from the OECD
NERA, 2008[22]	SFA analysis: 2.5% to 3% TFP analysis: 2%	1996 to 2006	Response to Deloitte paper. Results consistent with view that "*underlying growth in productivity ha fallen since the beginning of the current decade… [A] range that is consistent with the two sources of evidence… is 2.0% to 2.5% per year*".
NERA, 2008[23]	SFA analysis: 0.2%	1998 to 2006	Comparison against 68 US LECs Model includes measure of stranded assets
NERA, 2005[24]	SFA analysis: 1.5%	1996 to 2003	Comparison against 67 US LECs
Range from above studies	**0.5% to 3.0%**		

18. Ofcom has not considered the use of external data to supplement its assessment of efficiency it assumes that BT will need to pass through to customers between 2016 and 2019. This is set against the backdrop of around 5% efficiency assumptions Ofcom has set for a number of the charge controls since 2009.[25] Ofcom's assumption would appear at odds with the evidence for BT as a whole, since a high efficiency assumption for the regulated business would imply a low or even negative efficiency for the rest of the business that operate in competitive markets. It would

[17] Deloitte, Analysis of the efficiency of BT's regulated operations, 2013
[18] Deloitte, WBA consultation response, 2011
[19] Deloitte, Efficiency of BT's Network Operation, 2010
[20] Deloitte, Further Analysis of the Efficiency of BT's Network Operations, 2009.
[21] KPMG, BT Openreach efficiency review, 2008
[22] NERA, Comments on Deloitte report 'The efficiency of BT's network operations', 2008
[23] NERA, The Comparative Efficiency of BT Openreach, 2008
[24] NERA, The comparative efficiency of BT in 2003, 2005
[25] Ofcom, LLCC 2015. Figure A8.31.

be difficult to see how this is consistent with BT's relative position in those markets, as well as the evidence of TFP growth estimates for the telecoms sector obtained over a long time period.

International benchmarking study

19. Ofcom mentions the AT Kearney report in the LLCC Consultation[26]. This report was previously submitted to Ofcom which then considered its appropriateness in the 2014 WBA Statement. At the time, Ofcom "*consider that the other [AT Kearney] benchmarking of limited use for helping to set an appropriate efficiency target for WBA services particularly in light of BT's own caution about how to interpret it*" [27]. Ofcom does not explained why this report was considered of limited use in the WBA market review, but considers it relevant in the LLCC Consultation.

20. Ofcom draws on the results of this study and concludes that on a "*historic view… efficiency gains from this study are lower than those from... analysis of BT's management accounting data but they only reflect catch-up. But it does show that BT was not at the frontier*"[28].

21. If Ofcom adopts its previous approach and explicitly considers the 'catch-up' versus 'frontier shift' elements of efficiency, it would need to check the consistency of its overall efficiency assumption against the overall level of inefficiency BT relative to the selected benchmark, and the extent to which this is closed by the end of the control period. As we show below, Ofcom has not set this out in the LLCC Consultation.

TFP analysis for the UK

22. FTI's report for BT reviews regulatory precedents on efficiency and shows that "*other regulators consider TFP as part of their efficiency analysis*", as it is provides a useful cross-check on other analysis and considers whether BT "*can be expected to be more or less efficient than the benchmark*", [29] for example the UK economy as a whole. The table below summarises a number of TFP estimates for the telecommunications industry as well as for the UK as a whole.

[26] Ofcom, LLCC 2015. Paragraph A8.220.
[27] Ofcom, Review of the wholesale broadband access markets, June 2014, Paragraph A7.192: http://stakeholders.ofcom.org.uk/binaries/consultations/review-wba-markets/statement/Statement_Annexes.pdf
[28] Ofcom, LLCC 2015. Paragraph A8.231.
[29] FTI Consulting, BT Leased Lines 2015. Section 6.

Table 2: Summary of economy-wide TFP estimates

Source	*TFP estimate*	*Time period*	*Comments*
ONS, 2015	3.77% for Information & communication sector, compared against 0.33% for the whole economy	1998 to 2013	Used revised classification of industry sector to identify "Information & communication" sector separately.
OBR Economic and Fiscal Outlook, 2015[30]	Productivity per hour was 0.4% in 2014, increasing to 2.2% in 2020	Forecasts to 2020	Forecasts for UK economy, where the stable GDP growth picks up slowly as "*productivity growth slowly returns to historically normal levels*"[31].
ONS, 2013	7.3% for electrical machinery, post and telecoms companies	2001 to 2010	TFP growth estimated using firm-level data. Defined "EleCom" as an "*amalgam of electrical machinery plus post and telecommunication services and designed to proxy the 'hi-tech' industries*".
ONS, 2011	Around 2.5% for Transport, storage and communication sector, and around 1% for the economy as a whole	1970 to 2009	Used broad industry sector classifications, so telecoms included in "Transport, storage and communications". Averages calculated over time period due to "*volatility of year on year MFP growth*".
UN Productivity Database	-3.0% to 3%	1990 to 2000	The UK annual TFP growth rates have been volatile on a year-on-year basis, but shows that only 1 out of the 10 years had an annual growth of 3%.
Reckon, 2011	2.5% to 3.1%	1970 to 2007	Gross output TFP for telecoms and post industry in the UK based on analysis of UK KLEMS database. This sector is by far the largest contributor to overall economy TFP growth.
Range from above studies	**2% to 7%**		

Source: FTI Consulting, BT Leased Lines: Efficiency benchmarking. Section 6.

23. We note that the results consistently show that the Information, Communications and Technology ("ICT") sector is by far the largest contributor to overall UK economy productivity growth, with a cluster of estimates around 2% to 4% (with the 7% experimental study by the ONS setting the upper end of the range). The higher rates of growth observed, particularly for the mobile carriers, are consistent with the observation that massive regulatory reforms have been dominated by mobile communications sector reform, which have contributed significantly to firms' efficiency and TFP growth.

24. The economy-wide results for the ICT sector are consistent with those obtained using firm-level accounting data, for example, based on the time trend estimate of the SFA analyses carried out

[30] Office of Budget Responsibility, Economic and Fiscal Outlook, July 2015. http://cdn.budgetresponsibility.independent.gov.uk/July-2015-EFO-234224.pdf
[31] Office of Budget Responsibility, Economic and Fiscal Outlook, July 2015, Paragraph 1.17.

by both NERA and Deloitte summarised in Table 1. However, this evidence has not been considered by Ofcom.

Efficiency assumptions used by other regulators

25. FTI's efficiency report also provides a summary of the typical approaches adopted by other UK regulators and the Competition and Markets Authority ("CMA") (and previously the Competition Commission, "CC") in their assessment of efficiency for price setting. They noted that in sectors where there are fewer regulated companies, such as rail and civil aviation, "*ORR and CAA have both commissioned reports to analyse the real unit operating efficiency (RUOE) across regulated industries over time*". Moreover, the CMA/CC "*typically assess the full range of evidence presented to it when making its regulatory determinations, as well as introducing new analyses where relevant and appropriate*". [32]

[32] FTI Consulting, BT Leased Lines 2015. Section 6.

Table 3: Summary of estimates considered by other UK regulators

Regulator	*Frontier shift estimate*	*Time period*	*Approach*
Ofwat, PR14	Opex: 0.25% to 0.38%	2015 to 2020	DFA; panel COLS & random effects translog for both water and wastewater
Ofwat, PR09	Capex: 0.4% Opex: 0.25%	2010 to 2015	DFA; panel COLS & random effects translog for both water and wastewater
Northern Ireland Utility Regulator, Water PC15	Capex: 0.6% Opex: 0.9%	2016 to 2021	COLS; catch-up analysis based on English comparators
Ofgem RIIO-ED1	Opex: 1.0%	2010 to 2015	DFA, performance ratios. COLS, pooled with 3 years of historical data on 14 DNOs and benchmarking against the upper quartile.
Northern Ireland Utility Regulator, Electricity distribution & transmission, RP5	Capex: 1.0% Opex: 1.0%	2012 to 2017	Econometric analysis. Review of business plans of close comparators (GB DNOs)
Ofgem, RIIO-ET1	Capex/repex: 0.7% Opex: 1.0%	2010 to 2015	Bottom-up analysis
Ofgem, RIIO-GD1	Totex: 0.8% Opex: 1.0%	2013 to 2021	DFA of overall costs and disaggregated costs. Log-log model using OLS and panel time fixed effects approach; requirement to close 75% of efficiency gap
Ofgem, RIIO-T1	Opex: 1.0%	2013 to 2021	
ORR, PR13	Opex: 1.0%	2010 to 2017	DFA and SFA of total maintenance and renewal costs with panel data. COLS, random effects (with random effects measuring efficiency), time-varying SFA
PPP Arbiter	Opex: 1.0%	2010 to 2017	
CAA, Q6	Opex: 1.0%	2014 to 2021	
Postcomm 2006	Opex: 3.0%	2006 to 2010	DEA, SFA, DFA (comparison of sorting offices). Bottom-up analysis (business plan review)
Range from above	**0.25% to 3%**		

Source: FTI Consulting, BT Leased Lines: Efficiency benchmarking. Section 6.

26. FTI makes a number of observations regarding the factors that need to be taken into account when comparing evidence on frontier shift across different sectors. It considers that a qualitative analysis suggests that the evidence presented is a relevant consideration, and that there is scope for comparison with the services considered in the LLCC Consultation (the details are explored in separate TI and Ethernet sections in the main response).

27. Ofcom's more recent assessments of efficiency do not separate out between 'catch-up' and 'frontier shift', and therefore it is difficult to make a direct like-for-like comparison between the assumptions used in Table 3 and Ofcom's assumption of 5% for a number of its charge controls since 2009. Nonetheless, it does raise questions as to what the 5% efficiency assumption implies. If the reasonable general productivity trend is, say 2%, the balancing 3% must be catch-

up. This would suggest that as at 2014 (since the last series of charge controls were set) BT would be around 16%[33] less efficient than an otherwise efficient company operating on the production frontier. This gap would be greater if an incentive-based approach is taken (for example, by Ofwat and Ofgem) and Ofcom assumes that not all the inefficiency gap is closed over the duration of the charge control. A higher TFP estimate of, say 3%, would suggest that BT would be over 10% less efficient than a frontier benchmark. Ofcom has not stated how this compares against the information it considers appropriate on BT's level of inefficiency. As such, Ofcom has not demonstrated sufficient evidence for either components of efficiency, and has not checked the consistency of its assumptions, even against evidence that it has considered.

Use of BT data as primary source of evidence

28. Ofcom places undue weight on BT's own internal data despite reservations made by CC in its 2010 Determination of the Carphone Warehouse appeal[34] relating to the 2009 LLU/WLR charge control.

29. On the use of internal data, the CC stated that it was not "*convinced that Openreach's internal budget and forecasts… provided a more reliable basis for Ofcom's overall assessment… than the other evidence obtained by Ofcom to measure the general rate of efficiency improvement*"[35], and that "*there are some aspects of the rate of efficiency savings set by Ofcom which cause us some concern:*

    - *"… Ofcom may have had too much regard to BT's own forecasts"* and
    - *"… we think that Ofcom's task was to apply an efficiency target that would incentivize Openreach to bring its costs in line with those of an efficient operator, rather than to set targets closely aligned with the actual savings that the company proposes to make*".[36]

30. Furthermore, the CC also concluded that Openreach's own data "*provides a relevant benchmark for the rate of efficiency savings for at least the first year of the price control. Its relevance for subsequent years… would be no greater than the other evidence, including.. efficiency review and historical indicators*".[37]

31. On the use of historical trends, Ofcom has previous quoted the CC indicating that historical rates "*should be reliable for at least the first year of the price control, and represent useful indicators for the whole period under review*"[38]. However, the CC stated earlier in the same paragraph that "*we think that the predictive power of historic rates of efficiency saving diminishes over time as circumstances, including cost structures and technology trends, change*"[39].

[33] This assumes that the 3% catch-up element is made in every year from 2014 to 2019, the end of the charge control period currently being consulted on, i.e. $(1+3\%)^5 - 1 = 15.9\%$.
[34] Competition Commission, The Carphone Warehouse Group v Office of Communications. Case 1111/3/3/09, August 2010.
[35] Competition Commission, Case 1111/3/3/09, August 2010, Paragraph 2.190.
[36] Competition Commission, Case 1111/3/3/09, August 2010, Paragraph 2.165.
[37] Competition Commission, Case 1111/3/3/09, August 2010, Paragraph 2.192.
[38] Ofcom, Business Connectivity Market Review Statement, 2013 paragraph A12.77. Ofcom referred to the 2010 CC Determination.
[39] Competition Commission, Case 1111/3/3/09, August 2010, Paragraph 2.185.

32. In this section we examine Ofcom's use of BT's own data for the assessment of efficiency. This includes the use of management information, both historic and forecasts, as well as BT's public announcements. The analysis of cost trends are examined in detail under the separate TI and Ethernet responses.

Use of management information for target setting

33. The CC in its 2010 Determination stated that the "*target set by Ofcom for Openreach is not necessarily wrong merely because it can be exceeded, or because a plan to exceed it is adopted. In a system of incentive-based regulation, efficiency targets should be capable of being met and exceeded*.[40] This is somewhat different to Ofcom's 2013 LLU/WLR consultation where it stated that "*[s]etting the efficiency rate is therefore not about giving BT incentives but about ensuring that future prices are set at an efficient forecast cost level*"[41]. This mind-set is carried over in the LLCC Consultation, where Ofcom updated the efficiency assumption to 5% for TI and Ethernet services and arrived at a view of BT's modelled performance in 2013/14 that is closer to actual.[42] As such, it is necessary to revisit the academic literature around management incentives and target setting.

Internal planning documents build in stretch targets

34. Ofcom has reviewed a number of internal planning documents as part of its efficiency assessment in the past. For example in the 2013 BCMR, Ofcom looked at BT's Medium Term Plans ("MTP") which "*is an internal document used for planning purposes within BT. It sets out the financial outlook for BT for the next three years including efficiency targets set internally to BT Group*"[43]. However, Ofcom did not place significant weight on this evidence as it did not cover a sufficiently wide range of activities under consideration. In other charge controls, such as this one, Ofcom has referred to BT's internal management accounts known as PVEO analysis[44], where cost movements are accounted for in terms of Price (i.e. inflation) changes, Volume effects, Efficiencies and Other one-off costs. Deloitte's efficiency report (Annex G) reviews the existing literature and compares them against how Ofcom has used PVEOs as one of the key sources for setting the proposed efficiency range.

35. Deloitte's review found that there is "*considerable academic evidence to support the view that companies optimise performance by setting 'stretch' targets for business units*" even though "*they are less likely to be met than less ambitious targets but they still result in better performance*"[45]. This is supported by empirical evidence using experiments carried out. Ofcom's concern with using internal planning documents was not whether they could represent an over-ambitious plan, but that they "*are less likely to be influenced by downward bias*"[46].

36. As part of Deloitte's work, it carried out its own assessments of the PVEO data provided to Ofcom and were given opportunities to interview staff responsible for putting those together. They concluded that the efficiencies element of the PVEO analysis is "*retrospectively calculated to*

[40] Competition Commission, Case 1111/3/3/09, August 2010, Paragraph 2.191.
[41] Paragraph A7.18, Ofcom, LLU/WLR Consultation, July 2013
[42] Ofcom, LLCC 2015, Paragraph A8.158.
[43] Ofcom, Business Connectivity Market Review Statement, 2013, Paragraph A12.80.
[44] Ofcom, LLCC 2015. Paragraph A8.170.
[45] Deloitte, BCMR 2015. Section 3.
[46] Paragraph A16.29, Ofcom, Fixed Access Market Review Statement, 2014. http://stakeholders.ofcom.org.uk/binaries/telecoms/ga/fixed-access-market-reviews-2014/statement-june-2014/annexes.pdf

match the ambitious profit targets set by BT Group… not based on a bottom-up analysis of what performance targets can be realistically achieved… and determined by the need to meet ambitious financial performance targets".[47]

37. Furthermore, Deloitte also analysed internal evidence on BT's performance based on the Business Unit Review documents produced by BT, which provide quarterly updates on Openreach's performance against a number of targets set by management. Deloitte found that "*BT has consistently set targets above performance… and that BT's internal figures fall into the category of stretch targets"*.[48] Deloitte recognised that this information is only available to Openreach and not for BT as a whole, but it did not find "*evidence to suggest that the conclusions from this analysis do not apply to other parts of the business*".

Use of internal targets in setting price controls

38. Deloitte concludes that BT's internal targets are deliberately ambitious and that it would be "*damaging if charge controls were based on them*"[49] for the reasons set out below.

Asymmetric impact of regulation

39. There is widespread literature that considers that there are higher risks associated with setting prices too low than setting prices too high. We recognise that in other utilities sectors, the regulators have a duty to finance and/or to fund future investment, such that there is a need to explicitly consider companies' business plans. As such, regulators such as Ofgem and Ofwat have moved away towards a more incentive-based menu regulation. In setting BT's prices, Ofcom does have a duty to consider the impact on the long term benefits to consumers, which in turn is dependent on the development of the market, one of which is the "*ambitious network investments expected from BT*" to meet significant increases in demand over the next few years. As Deloitte notes, "*setting an X factor primarily on the basis of information from internal management targets, which… present an aspirational, rather than an unbiased estimate of future efficiencies, does not appear to be consistent with a conservative and cautious approach, as would be expected from regulatory best practice*".[50]

Ratchet effect

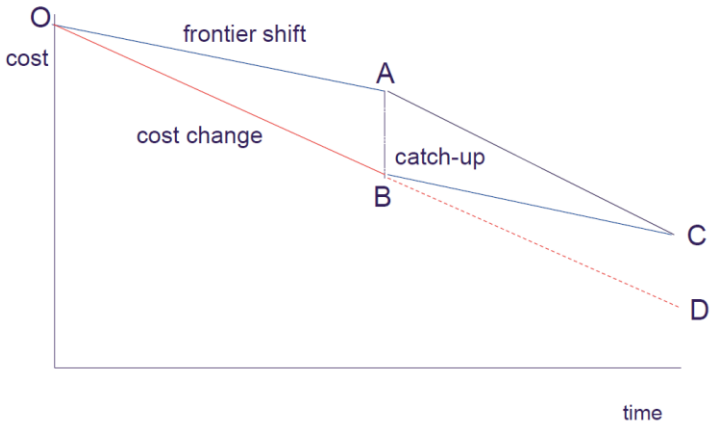
40. The other well-known issue around the use of internal management information for target setting is the ratchet effect, whereby in a repeated price setting set-up, good performance is "rewarded" in the subsequent price setting via higher expectations for further efficiency savings. Such a framework will undoubtedly dampen future incentives for outperformance.

41. The diagram below illustrates that there is a sharing of rewards from efficiency savings between the regulated firm and its customers over time even if efficiency is set at the level of the overall frontier shift. Indeed, FTI's review of approaches to efficiency also highlighted that some regulators, such as Ofwat, make explicit assumptions about what proportion of the catch-up should be included in the price control as "stick", and the remainder left as "carrot" for the regulated firms to obtain and keep, but only until the periodic review when prices are reset with

[47] Deloitte, BCMR 2015. Section 3.3.
[48] Deloitte, BCMR 2015. Section 3.1.3.
[49] Deloitte, BCMR 2015. Section 3.2.
[50] Deloitte, BCMR 2015. Section 3.

reference to underlying costs.[51] Ofcom in the past has also excluded a catch-up element where there is no evidence for it.[52]

Figure 1: Illustration of the ratchet effect



Source: BT presentation to Ofcom, 5 February 2015

42. The above diagram shows that the benefits of 'catching-up' is shared between BT over time, and customers will reap the full benefits transferred by the end of the subsequent charge control. The possibility of outperformance creates the maximum incentive to reduce costs rapidly, with long term benefits to customers. There are two benefits to this: firstly, the reduced costs are passed onto customers at the next charge control, and the incentives provide the ability to find further efficiency improvements for the future to ensure that continuing efficiency is possible. The latter is key for long term dynamic efficiency benefits.

43. Ofcom considers that the ratchet effect is mitigated "*by the incentives inherent in price cap regulation (i.e. to outperform the control once set), and by our use of glide paths*".[53] However, as the economic literature shows, the incentives are damaged in the long term, and Ofcom's view is based on a narrow vision focused only on the charge control in question. Furthermore, The justifications for increasing its efficiency assumptions in the LLCC Consultation are misplaced:

    - Ofcom's summary of efficiency assumptions used in previous charge controls as "*a context and a base*"[54] to set its proposed range entrenches its approach rather than providing evidence to support its current analysis.

    - The use of BT's outperformance in Annex 5 of the LLCC Consultation falls into the ratchet effect trap. Furthermore, Ofcom's assessment of BT's financial performance does not consider a break-down of the efficiencies, where some, such as one-off gains, should not be included in an assessment of future efficiency targets.

[51] FTI Consulting, BT Leased Lines 2015. Paragraph 4.24.
[52] See for example, Ofcom, Leased lines charge control Statement, 2009, Annex 7.
[53] Ofcom, Fixed Access Market Review Statement 2014, Paragraph A16.29.
[54] Ofcom, LLCC 2015, Paragraph A8.151.

- Ofcom's alignment of efficiency and management targets will damage incentives for outperformance, since it could be used for higher efficiency targets when prices are next reset.

44. Deloitte describes Ofcom's approach as "*removing the incentives to "beat the target" undermines the positive incentive properties of the RPI-X price control*" which may lead to "*negative consequences not only for the current, but also future controls*".[55] Whilst other regulators appear to be moving towards a more incentive-compatible form of regulation, it appears that Ofcom is more focused on more short-term cost-based regulation and foregoing the long term dynamic efficiency benefits.

Use of PVEO analysis

45. In Deloitte's interviews with BT[56], they identify a number of issues with the definition of "efficiency" within the PVEO analysis, and specifically how it is applied within Ofcom's cost forecasting model. This is consistent with the various submissions BT has made to Ofcom regarding the use of this data, which Ofcom makes no mention of in the LLCC Consultation.

46. Deloitte identifies five key issues with the use of unadjusted PVEOs, as Ofcom has done, that would result in an upward bias of its assessment of potential efficiency gains:

    - Double counting of economies of scale effects. Ofcom already takes into account effects of scale economies via the AVEs and CVEs being less than 1, and efficiencies are applied in addition to these. Deloitte found that cost savings due to economies of scale are captured in the "E" component rather than the "V" component of the PVEO analysis.

    - Double counting of efficiencies across lines of business. Although Ofcom recognises that there are internal transfers from BT Technology, Service & Operations unit ("TSO") to other lines of business, Deloitte believes that TSO should be excluded completely, since efficiencies identified within TSO would be reflected in either Openreach or Wholesale PVEO. By including even a proportion of TSO, "*Ofcom appears to be double counting a significant element of the cost reductions*".

    - "E" component does not only relate to efficiency, but includes elements of prices (for example regulated prices of services bought by Wholesale from Openreach) and accounting adjustments.

    - Efficiency initiatives vary significantly across products, and applying an aggregate efficiency reduction across all network operations to specific products may overstate the potential for achievable efficiencies. This is particularly the case for 20C network and products, which include TI services, where there are little new efficiencies expected.

[55] Deloitte, BCMR 2015. Section 3.
[56] Deloitte, BCMR 2015. Section 3.

- Capex efficiency is significantly smaller than opex efficiency, but Ofcom applies a single efficiency target to both existing and new capex, as well as opex in its cost forecasting model.

47. These issues are not unknown to Ofcom. Openreach, in its response to the 2013 Fixed Access Market Review Consultation, highlighted the need to calculate an alternative "E" that would be consistent with Ofcom's modelling approach. Ofcom accepted Openreach's suggested changes for the 2014 Statement and adjusted its assessment. We believe the same should be applied here.

48. Furthermore, BT's submissions to Ofcom highlighted that the "E" part of the PVEO analysis would tend to be "*a gross representation of the saving delivered / to be delivered, and not the overall net cash benefit*". This is in contrast to Ofcom's statement in the LLCC Consultation that "*it takes into account any additional costs incurred in delivering those efficiencies*". [57]

49. Ofcom's analysis of PVEOs does not take into account issues already identified by BT, and subsequently confirmed by Deloitte's independent assessment of the information. This results in an upward bias to the efficiency estimates set out in Annex 8 of Ofcom's LLCC Consultation, nothwithstanding Ofcom's focus on the use of information that already builds in a level of stretch.

Use of BT announcements

50. Ofcom places considerable weight on BT's public announcements[58] to support its use of the (higher) estimates obtained through the PVEO analysis, and rejects the (lower) estimates based on external sources.

51. As FTI points out[59], these public announcements do not identify the sources of these cost reductions, be it from efficiency, volume effects or input price effects. These are all valid sources of cost reductions, and Ofcom is not comparing like with like when it applies efficiency as a total factor productivity measure in addition to volume and price effects. Furthermore, messages to the investor community tend to be at a high level and do not identify the business units, cost types or products. Deloitte's assessment of PVEOs recognised this point, suggesting that simple comparisons of this type are not appropriate.

Summary & conclusion

52. There is a wealth of alternative sources of evidence available regarding the potential for TFP improvements which are a relevant check against Ofcom's assumptions which are based on BT's own internal data. We do not consider the long term reliance on the latter is appropriate, and does not conform to standard practice of incentive regulation. Moreover, the straightforward application of the data itself is flawed, and requires further analysis to ensure that it is consistent with the way Ofcom intends to apply it in its cost forecasting model.

[57] BT response to Ofcom's 6th LLCC s135, 28 November 2014.
[58] Ofcom, Business Connectivity Market Review Statement, 2013, Paragraph A8.232.
[59] FTI Consulting, BT Leased Lines 2015. Section 3.