Response to Ofcom's consultations on the Physical Infrastructure and the Business Connectivity Markets

Annexes 2-6

25 January 2019

Contents

A2 Weighted Average Cost of Capital 3

A3 Regulation of BT core nodes 25

A4 Data Centres 31

A5 Deregulation of Traditional Interface Services 32

A6 Consultation Questions 35

A2 Weighted Average Cost of Capital

2.1 Ofcom has lowered its WACC estimate for the BCMR to 8.0%, from 9.8% (nominal, pre-tax) in its 2016 BCMR and 8.9% in the 2018 WLA. Ofcom continues with its disaggregated WACC approach, disaggregating the BT Group WACC into 'Openreach Access', 'Other UK Telecoms' and 'Rest of BT'. The 'Other UK Telecoms' WACC is applied to business connectivity markets, and specifically to dark fibre at BT-only exchanges in Ofcom's current BCMR proposals (where it proposes a cost-based charge control).

2.2 Ofcom's reduction in the WACC for 'Other UK Telecoms' relative to the 2018 WLA is driven by three principal changes:

- A reduction in the real total market return (TMR), the sum of the risk-free rate and the equity risk premium (ERP), from 6.3% to 5.8% in real terms against RPI;
- A reduction in the real risk-free rate, from 0% to -1.25% in real terms against RPI; and
- A reduction in the asset beta, from 0.73 to 0.65.

2.3 We have major concerns with all three of the above changes. Given the Government's stated aim of encouraging fibre investment, it would be inappropriate of Ofcom to lower its estimate of the cost of capital at this time. Ofcom's proposed reduction in the 'Other UK Telecoms' WACC from 8.9% in its March 2018 WLA decision to 8.0% in its BCMR consultation, in the space of only eight months, creates uncertainty for investors looking to commit capital, particularly because there has been no significant change in market fundamentals since the WLA decision. Ofcom recognises the uncertainty around estimating individual parameters underpinning its WACC calculation, and it should therefore exercise caution to ensure investors have sufficient certainty to invest in major capital projects such as fibre rollout.

2.4 Whilst the WACC applies to dark fibre at BT-only exchanges in Ofcom's current BCMR proposals, the estimate may have an impact on future Ofcom WACC determinations. Ofcom has historically relied on its previous determinations in informing future WACC estimates. For example, Ofcom's approach to estimating the total market return 'TMR' in this consultation and in the 2018 WLA determination includes references to prior regulatory precedent. Therefore, it is crucial that individual parameter estimates for this BCMR are set based on reliable and robust evidence, given Ofcom may rely on these estimates at future reviews, including the integrated market review due to commence in 2021.

2.5 We explain our concerns with Ofcom's changes further in this Annex, but in summary:

- **Total market return**: Ofcom places too much weight on some specific forward-looking Dividend Growth Model 'DGM' evidence, whilst ignoring other DGM-based estimates. Given that the DGM requires the use of subjective assumptions that produce a wide confidence interval for estimates, long-run historical evidence, based on actual observed returns, remains the most objective method for setting the expected TMR, and also captures the inherent stability in the TMR over time. We consider a real TMR (CPI-deflated) of 7.0%, based on long-run historical

evidence, as opposed to Ofcom's estimate of 6.7%, is therefore the most reliable estimate for this BCMR.

- **Risk-free rate:** Ofcom uses short-run averages of gilt yields, which result in unstable estimates across regulatory reviews. This creates unnecessary uncertainty for investors. Whilst long-run historical averages suggest a real risk-free rate slightly below zero, we show that interest rates are set to increase over the period. Given this, Ofcom's March 2018 real-risk free rate estimate of 0% remains appropriate. A real risk-free rate estimate of 0% is also consistent with ten and fifteen year historical averages of gilt yields, capturing the expectation that interest rates are expected to increase towards their long-run historical average in the coming years.
- **Asset beta**: Ofcom's estimate of 0.65 underestimates the asset beta for business connectivity markets, because it does not recognise that these markets tend to be more risky than the other services that fall within 'Other UK Telecoms'. There has been no material change in the systematic risk of business connectivity markets since Ofcom's 2016 BCMR decision. We therefore conclude its 2016 BCMR beta estimate of 0.70 remains appropriate.

2.6 We also estimate a higher cost of debt based on the higher risk-free rate above, which is a consequence of Ofcom's approach to estimating the cost of new debt as the sum of the risk-free rate and debt premium. A higher risk-free rate of 0% increases Ofcom's cost of new debt estimate from 2.9% to 4.2%, and consequently increases the overall cost of debt from 4.0% to 4.2%. We agree with Ofcom's move towards calculating the cost of debt as a weighted average of existing and new debt costs, including its calculation of the cost of existing debt based on BT's actual embedded debt costs.

2.7 Reflecting these amendments to the Ofcom approach, we estimate a WACC (nominal, pre-tax) for BCMR of 8.8% compared to Ofcom's estimate of 8.0% as set out below.

Table 1.1 - WACC Estimate with BT's proposed amendments

	Ofcom Estimate	BT Estimate
Real RFR	-1.25%	0.0%
RPI	2.9%	2.9%
Nominal RFR	1.6%	2.9%
Nominal ERP	7.2%	6.3%
Debt beta	0.10	0.10
Asset beta	0.65	0.70
Asset beta weight	65%	65%
Fwd-looking gearing	35%	35%
Equity beta	0.95	1.02
Cost of equity (post-tax)	8.4%	9.3%
Cost of equity (pre-tax)	10.2%	11.3%
Debt premium		
Corporate tax rate	17%	17%
Cost of debt (pre-tax)	4.0%	4.2%
WACC (pre-tax nominal)	**8.0%**	**8.8%**

2.8 In this annex, we discuss Ofcom's proposed approach to estimating each of the three parameters in paragraph 1.7 above, and propose alternative estimates.

Total Market Return

2.9 Ofcom's reduction in the TMR is driven by more weight being placed on forward-looking evidence derived from a dividend growth model 'DGM', rather than long-run historical averages that it placed weight on previously.[1] The forward-looking DGM estimates rely on subjective assumptions. Altering these assumptions to credible alternatives leads to materially different TMR estimates. Ofcom's approach is not, therefore, robust to reasonable alternative assumptions.

2.10 Long-run historical evidence continues to be the most appropriate basis for setting the TMR, pointing to a real TMR (CPI-deflated) of 7.0%, higher than Ofcom's estimate of 6.7%.[2]

2.11 Ofcom presents four types of evidence to estimate the TMR:[3]

- Historical ex post evidence: this suggests a TMR of around 6% to just over 7%;
- Historical ex ante evidence: this suggests a TMR of 6% or lower;
- Forward-looking evidence based on a DGM: Europe Economics estimates a range of 6.4% to 6.7%; and
- Empirical evidence of a positive relationship between the risk-free rate and TMR: Ofcom argues that the decline in gilt yields has coincided with a reduction in the TMR, which implies a lower TMR than in the past.

2.12 On the basis of the above, Ofcom provisionally concludes on a TMR range of 6.25% to 7.0%, derived in large part from Europe Economics' DGM evidence. The lower bound in Ofcom's range of 6.25% is not rooted in a particular empirical approach, as it is lower than Europe Economics' DGM estimates, and is not specifically derived from any of the alternative approaches Ofcom describes. Although Ofcom presents historical ex ante evidence that suggests a TMR of 6% or lower, and Europe Economics presents TMR estimates from other regulated sectors of 5% to 6.5%, Ofcom does not explicitly link its lower bound TMR estimate of 6.25% to either of these methods. Ofcom concludes on a point estimate of 6.7%, at the mid-point of its range.

Historical ex-post evidence

2.13 The most common approach to estimating the TMR is to draw on historical realised returns. This approach assumes that historical realised returns provide an unbiased estimate of the expected return over long time periods. Because the TMR tends to be relatively stable over time, long run historical returns are the most reliable method for

[1] Ofcom previously placed more weight on long-run historical averages of realised equity market returns. See for example, Ofcom (28 March 2018): "Wholesale Local Access Market Review: Statement", Appendix 20, paragraph A20.108, p105.
[2] In its BCMR consultation, Ofcom has reduced its estimate of the TMR (RPI-deflated) from 6.3% to 5.8%. Its real TMR (RPI-deflated) estimate of 5.8% equates to a real TMR (CPI-deflated) estimate of 6.7%. Henceforth in this section, when we refer to TMR estimates, we refer to the CPI-deflated estimates for consistency with Ofcom's analysis.
[3] A21.58

estimating the *expected* TMR going forward, as they capture, more accurately than other methods, this long-run stability.

2.14 Europe Economics themselves explain why a historical ex post approach provides an objective method for estimating the TMR:[4]

> *'The rationale for using this long time period (as long a time period as possible) is that it maximises the amount of information available on which to form a forward-looking estimate, i.e. an expectation about future market returns. The benefit of having as much information as possible is that the total market return, by definition, includes risky assets, and therefore the actual outturn in any one year is a poor indicator of expected returns in the future…By using very long-run series of returns, we aim to capture a significant portion of the total probability distribution of returns that an investor today might account for in decisions about the future.'*

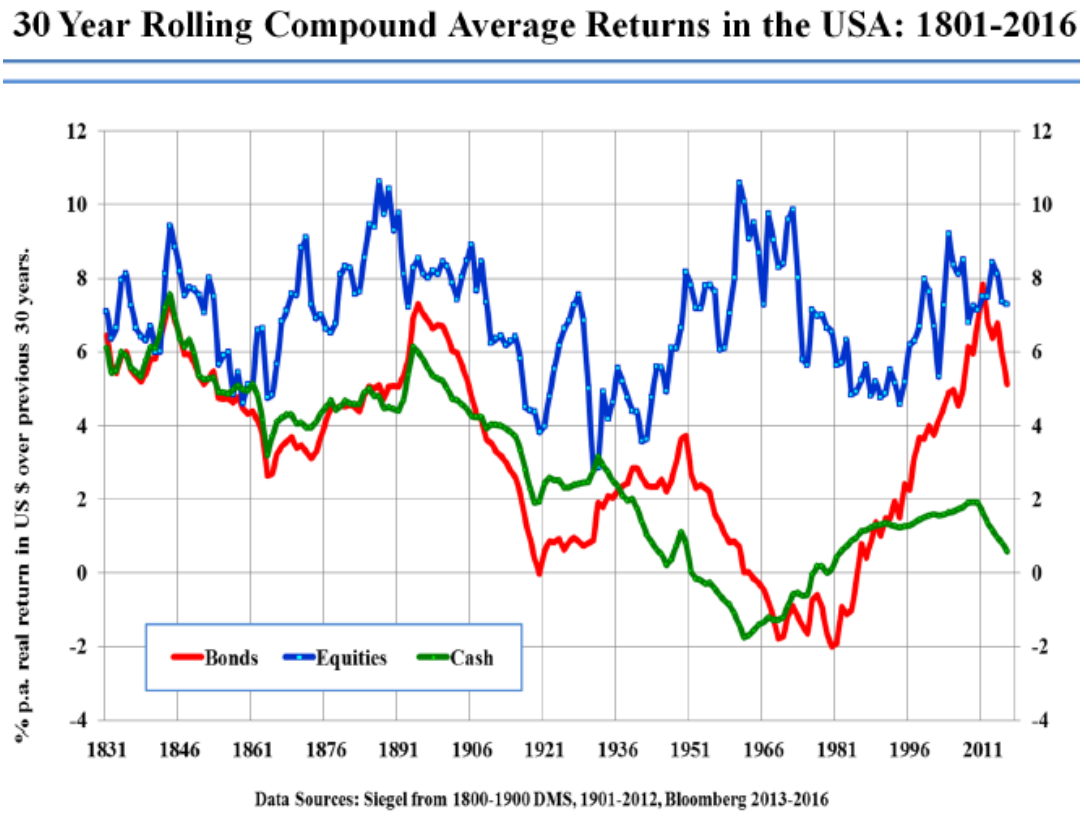
2.15 Ofcom uses the Dimson, Marsh and Staunton database to calculate the TMR based on long-run historical returns. This database is the standard reference point for UK regulators as well as financial practitioners. Based on this data source, Europe Economics estimates a TMR of 7.0%. This TMR estimate is the most objective estimate for setting the TMR for the BCMR (for the reasons that Europe Economics give).

2.16 We note an academic study commissioned by UK Regulators' Network (UKRN) in early 2018 supports the use of long-run historical realised returns to estimate the TMR.[5] The study concluded that long-run stock returns are stable in real terms, even following periods of very low interest rates, as shown in the figure below. Hence, there is no reason for investors to expect the TMR to be any different from its long-run historical average.

[4] Europe Economics (October 2018): "Cost of Capital: Total Market Return", p6.

[5] Wright, S, Burns, P, Mason, R, Pickford, D (2018): "Estimating the cost of capital for implementation of price controls by UK Regulators - An update on Mason, Miles and Wright (2003)", p38.

Figure 1.2 – Stability in equity returns in the long-run compared to instability in bond and cash returns



Source: Wright, S, Burns, P, Mason, R, Pickford, D (2018): "Estimating the cost of capital for implementation of price controls by UK Regulators - An update on Mason, Miles and Wright (2003)", p38.

Historical ex-ante evidence

2.17 Ofcom also presents TMR estimates based on historical *ex ante* evidence, where the TMR is estimated based on dividend yields and dividend growth rates. Ofcom finds that this approach provides a TMR estimate of 5.7% at most, lower than historical *ex post* estimates.

2.18 Ofcom suggests that relatively high realised returns (i.e. *ex post* returns) in the second half of the 20th century might have been based on unrepeatable factors, or simply good luck, such that historical *ex post* evidence could overstate future expected returns.[6]

2.19 This view appears to be prompted by adjustments made by Dimson, Marsh and Staunton (DMS) in their 2018 study[7] (which is cited by Ofcom) to strip out the portion of historical equity risk premia (derived from historical realised returns) which might be attributable to non-repeatable luck.[8]

[6] A21.52

[7] Dimson, E, Marsh, P, Staunton, M (February 2018): "Credit Suisse Global Investment Returns Handbook 2018", p31-36.

[8] DMS find that globally diversified investors might expect an arithmetic average ERP over treasury bills of 5.0%, which equates to an expected TMR of 5.9%. They state 'If we assume that the historical real growth rate of dividends on the world

2.20 But there is no clear evidential basis for the DMS adjustment. DMS simply assume that a proportion of historical dividend growth (decomposed from historical realised returns) can be attributed to good fortune, but this assumption is not supported by objective evidence showing that historical growth in dividends can be attributed to good fortune (or indeed bad fortune). Accordingly, the DMS study does not provide conclusive evidence of a reduction in expected market returns relative to historical realised returns.

2.21 We also note that the 2018 academic study (commissioned by UKRN) concluded that adjustments to historical realised returns (such as the ones in the DMS study) are not practical in a regulatory context. The UKRN study notes there is not yet a clear academic consensus on the quantitative link between valuation ratios and future returns, and hence an adjustment in a regulatory context would not be defensible using established academic theory.[9] The study concludes that unadjusted historical realised returns remain the most objective and defensible method for estimating the TMR in a regulatory context.

2.22 We consider that historical *ex ante* evidence is not appropriate for setting the TMR (nor should it be used to inform a TMR range) because they rely on adjustments that are not based on objective assumptions. The bottom end of Ofcom's TMR range (6.25%) appears to be partly informed by this historical *ex ante* evidence, and excluding this evidence would increase the bottom end of the range (and change the mid-point).

Forward-looking evidence

2.23 Ofcom commissioned Europe Economics to consider the most appropriate method for estimating the TMR in light of financial market conditions since the global financial crisis. Europe Economics argues that more weight might be placed on a forward-looking DGM than has been the case in the past. Further, that financial market conditions since the global financial crisis have resulted in lower market returns, and so less weight should be placed on long-run historical data.

2.24 We do not agree with the suggested role for DGM in estimating the TMR (nor Ofcom's reliance on the Europe Economics estimates). As Europe Economics themselves show, different assumptions about long-run dividend growth can result in a significant difference in the TMR estimate, and there is no objective method for determining the most appropriate assumptions. By contrast, long-run historical data provides an objective method because it represents *realised* returns, and is not, therefore, subject to varying assumptions about long-run dividend growth as is the DGM approach.

2.25 Moreover, the DGM results are volatile over time, which creates additional regulatory risk for investors, who place value on stability in the WACC estimate over time. This is particularly true in telecoms markets, where certain investments are made over a long time horizon with long asset lives.

index was at least half attributable to past good fortune, then the prospective premium on the world index declines to around 3½% per year.' Dimson, E, Marsh, P, Staunton, M (February 2018): "Credit Suisse Global Investment Returns Handbook 2018", p36.

[9] Wright, S, Burns, P, Mason, R, Pickford, D (2018): "Estimating the cost of capital for implementation of price controls by UK Regulators - An update on Mason, Miles and Wright (2003)", p41.

2.26 The subjectivity of Europe Economics' DGM can also be demonstrated by comparing its results with alternative DGMs developed by other independent parties. For example, both the Bank of England and Bloomberg publish TMR estimates based on a DGM, which are widely used by investors to calculate expected returns. Their results are typically higher than Europe Economics' estimates, providing strong evidence that DGM results are sensitive to underlying assumptions and therefore unsuitable as a tool for setting the TMR parameter in a regulatory context.

Table 1.3 – Comparison of Europe Economics TMR estimates with Bank of England and Bloomberg

Source	Total Market Return Estimate (Nominal)
Europe Economics for Ofcom	8.4% - 8.7%
Bank of England	c. 10.4%
Bloomberg	c. 13%

Note: We have restated Europe Economics' real TMR range of 6.4% to 6.7% in nominal terms, assuming 2% CPI inflation. Source: Ofcom 2018 BCMR Consultation, paragraph A21.54, p214, Figure A21.5, Bloomberg.

2.27 The Bank of England's ERP estimates (based on its DGM) are presented below. There are key differences between the Bank of England and Europe Economics in their assumptions on long-run dividend growth.

- The Bank of England assumes weighted-average international GDP growth forecasts (where the weights are the proportion of revenues generated by FTSE All-Share companies across different regions).[10]
- Europe Economics uses projections of UK GDP growth to forecast dividend growth.

2.28 Ofcom assumes the FTSE All Share Index is a benchmark investor's reference index.[11] Any TMR estimates based on the DGM should, therefore, reflect the expected market return of the FTSE All Share Index. Since the companies that make up the FTSE All Share Index earn revenues internationally, and not just in the UK, the expected market return of the index should reflect international growth prospects rather than solely UK domestic growth. The TMR based on the DGM should reflect international revenue growth rather than UK revenue growth alone (which is the approach adopted by Europe Economics).

2.29 The figure below compares long-run GDP growth forecasts for the UK (the Europe Economics basis for forecasting dividend growth) with international long-run GDP growth forecasts, derived from the weighted average GDP growth forecast for the countries in which FTSE All-Share companies derive their revenues (the Bank of England

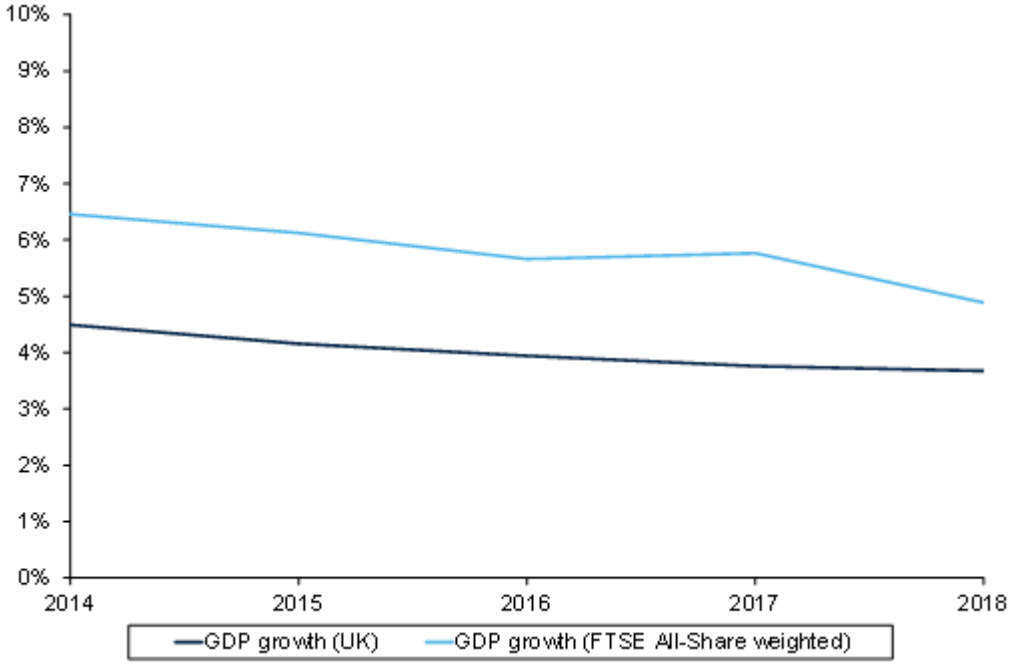
[10] The Bank of England notes that the FTSE All-Share has a high degree of international exposure. Firms in the index generate around 70% of their revenues outside of the UK. As a result, the Bank of England's dividend discount model attempts to capture the influence of the overseas growth outlook on the prospects for an equity index's dividend growth. The model assumes that at long horizons dividends are expected to grow in line with a weighted average of the long-term GDP forecasts for different regions. See Dison, W, Rattan, A (2017): "An improved model for understanding equity prices", Quarterly Bulletin 2017 Q2, p91.

[11] Ofcom's beta estimates for UK companies is based on a regression against the FTSE All Share index, implying its reference market is the FTSE All Share index. Source: A21.96.

approach).[12] The figure shows that the IMF has consistently forecast higher international long-run GDP growth than UK GDP growth over the past five years.

2.30 This implies estimates of the TMR for the FTSE All-Share index based on UK GDP growth would underestimate the actual TMR because FTSE All-Share companies are expected to grow at a faster rate in the long-run using more appropriate international GDP growth estimates. Therefore, Europe Economics' use of projections of UK GDP growth to forecast dividend growth in its DGM is not appropriate.

Figure 1.4 – Forecasts of UK growth are lower than international GDP growth



Source: Oxera analysis based on data from Bloomberg and IMF (2018): "World Economic Outlook"

2.31 The Bank of England's DGM analysis current implies an ERP of around 9%.[13] As current spot rates on 10-year UK gilts are around 1.4%, this implies a nominal TMR of 10.4%, around 1% higher than the top end of the TMR range presented by Europe Economics based on its DGM. The difference in estimates highlights the subjectivity of TMR estimates based on the DGM.

[12] The figure shows GDP growth forecasts from the IMF, and the weighted average international GDP growth forecast is calculated using weights that represent the proportion of revenues generated by FTSE All-Share companies across the different regions in which they operate.
[13] Ofcom, Figure A21.5

Figure 1.5 - Bank of England ERP estimates derived from a DGM

Source: Ofcom (November 2018): "Business connectivity market review", p217, Figure A21.5.

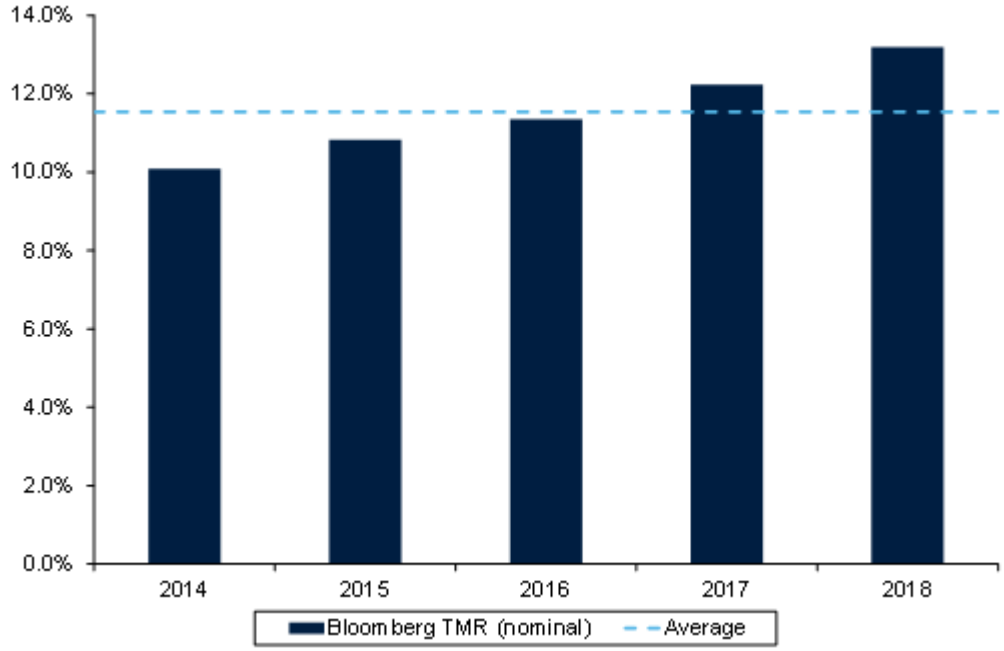
2.32 Ofcom considers it is reasonable for Europe Economics' estimate of the ERP to be lower than the estimates presented by the Bank of England, since the estimate "*of the RFR, from which* [Ofcom's] *ERP is derived, is informed by more recent evidence on government gilts*".[14] However, Figure 1.5 above shows that the Bank of England's ERP estimates based on its DGM have been stable over the last 4-5 years, so shortening the averaging period of government gilts to give more weight to recent evidence would not materially change the Bank of England's TMR results. Ofcom has therefore not justified why Europe Economics' assumptions are more appropriate than the Bank of England's.

2.33 We have also compared Europe Economics' TMR estimates with Bloomberg's estimates. Bloomberg estimates the TMR using its own proprietary three-stage DGM. These estimates are widely used by investors and industry professionals.

2.34 Bloomberg's estimate of the UK nominal TMR in 2018 was around 13%, more than 3% higher than the top end of Europe Economics' range. Bloomberg's TMR estimates have been consistently higher than Europe Economics' range for the past five years. This places further doubt on Europe Economics' DGM analysis, highlighting that DGM-based estimates tend to vary widely depending on the choice of dividend growth assumptions.

[14] A21.66

Figure 1.6: Bloomberg DGM TMR estimates



Source: Oxera analysis based on data from Bloomberg

2.35 Finally, we note that the UKRN 2018 study also argued against the use of DGMs to estimate the TMR in a regulatory setting. The study argued that DGM estimates tend to provide a very wide range of results depending on the assumptions used,[15] and therefore identifying a reasonable range and an appropriate point estimate for the purposes of regulation is challenging:[16]

> "*we cannot point to a methodology for using DDM* ['Dividend Discount Model', also known as Dividend Growth Model] *to calculate the EMR* ['Expected Market Return'] *that would be simultaneously implementable and defensible*"[17]

Relationship between risk-free rate and TMR

2.36 Ofcom argues that there is a positive relationship between the TMR and the risk-free rate. Europe Economics estimates correlation coefficients between the real TMR, based on its DGM estimates, and risk-free rate based on gilt yields between 2004 and 2018, and finds that the correlation coefficient is between 0.3 and 0.6. Because gilt yields have declined since the global financial crisis, Ofcom argues the TMR must have also declined, which warrants a lower estimate than in its previous decisions.[18]

2.37 However, Europe Economics' analysis of the correlation in returns is based on a very short period of data. Given TMR estimates based on the DGM tend to be volatile over time, a long period of data is required to establish a well-founded link between the risk-

[15] Wright, S, Burns, P, Mason, R, Pickford, D (2018): "Estimating the cost of capital for implementation of price controls by UK Regulators - An update on Mason, Miles and Wright (2003)", p44-46.
[16] Ibid., p47.
[17] The 'expected market return' is also known as the total market return in this context.
[18] A21.55 – A21.56.

free rate and the TMR. Academics have reviewed such long-run historical data to evaluate whether there is a causal link. Siegel (1998), who analysed 200 years of US stock market data, finds a remarkable degree of stability in equity returns over time, in contrast to the risk-free rate:[19]

> *"the growth of purchasing power in equities not only dominates all other assets but is remarkable for its long-term stability. […] This remarkable stability of long-term real returns is a characteristic of mean reversion, a property of a variable to offset its short-term fluctuations so as to produce far more stable long-term returns. […] As stable as the long-term real returns have been for equities, the same cannot be said of fixed-income assets."*

2.38 Finance theory explains that there is a negative relationship between the risk-free rate and the ERP which is associated with increased risk aversion and the so called "flight to safety" effect during periods of economic and financial crisis. At times of economic uncertainty, investors dispose of risky assets such as equity in favour of assets such as government bonds which offer a reasonable proxy for risk-free assets. This reduces the price of equities and increases the premia for holding risky assets, while reducing yields on risk free assets.[20]

2.39 Empirically, a number of studies have found that the negative relationship between the risk-free rate and ERP is one-for-one in the long run (which implies that the TMR is stable over time). For example, the 2018 UKRN study highlighted the stability of equity market returns compared to bond returns, implying the risk-free rate and ERP are inversely related with a one-for-one relationship in the long run. Figure 1.2 shows that periods of negative real interest rates, such as the current interest rate environment, are not unique. The 1950s and 60s were also periods of negative real interest rates, and also coincided with an ERP above the long-run average.

2.40 Given the expected TMR is inherently unobservable, we do not consider it appropriate for Europe Economics to infer a positive correlation between the risk-free rate and TMR based on only 14 years of data. The long-run historical data demonstrates there is an inverse one-for one relationship between the risk-free rate and ERP, such that the TMR is stable, and hence the TMR should not be lowered following a decline in the risk-free rate. [21]

TMR conclusion - Ofcom has placed too much weight on forward-looking DGM evidence, even though it relies on subjective assumptions on dividend growth, which if changed, lead to higher estimates of the TMR. Long-run historical evidence remains the most objective method for setting the expected TMR, and also captures the inherent stability in the TMR over time. Therefore a real TMR (CPI-deflated) of 7.0%, based on long-run historical evidence should be used.

[19] Siegel (1998), Stocks for the Long Run. McGraw-Hill, second edition, p.11, 13.
[20] Wright, S. et al. (September 2006), Report on the Cost of Capital – provided to Ofgem, Smithers & Co Ltd;
[21] We note that even if there is a positive relationship between the risk-free rate and the TMR, Ofcom's TMR estimate does not take account of the expectation that interest rates are likely to rise in the coming years. The market is currently forecasting that interest rates will increase, and under Ofcom's view of a positive relationship with the TMR, this will result in an increase in TMR relative to current levels.

Risk-free Rate

2.41 BT does not agree with Ofcom's proposed change to the risk-free rate based on the use of spot rates and short-term averages rather than long-term averages as this will result in estimates that are likely to be volatile over time. If spot rates are used, Ofcom should recognise market expectations that rates will rise over the review period. Our reasoning is set out below.

2.42 Ofcom estimates a real risk-free rate of -1.25%,[22] compared to 0% in its WLA decision in March 2018. This is mainly because Ofcom gives more emphasis to shorter-run and spot yields of index linked gilts 'ILG' than to longer run average yields.

2.43 Ofcom argues that long-run averages result in a risk-free rate that is slow to adjust to current market data, and therefore may not result in efficient price and investment signals.[23] Noting that low gilt yields have persisted for a long period of time since the global financial crisis and are unlikely to return to pre-crisis levels soon, Ofcom concludes that short-run averages and spot yields are now more relevant for setting the risk-free rate. Ofcom calculates the 5-year average yield as -1.25% and the spot yield as -1.7%, based on data up to August 2018, and selects the 5-year average as its final point estimate.

2.44 Ofcom's change in method towards short-run averages has two principal drawbacks: (1) it does not reflect market expectations that interest rates will increase, and (2) it results in unstable risk-free rate estimates over time, creating unnecessary regulatory instability.

2.45 Ofcom's reduction in the risk-free rate since its March 2018 WLA decision by 125bps is particularly at odds with changes in interest rate expectations over that period. Market indicators, including from the Bank of England and other independent forecasting agencies, all point towards an increase in interest rates in the coming years. Despite no discernible change in market fundamentals for interest rates since its 2018 WLA decision and with interest rates expected to move upwards, Ofcom has exercised its own discretion in changing its methodology to reduce the risk-free rate by 125bps.

<u>Ofcom's approach does not factor in current expectation of increasing interest rates</u>

1.1. Table 1.7 below shows forecasts of the Bank of England Base Rate by a range of different forecasting agencies, as reported by HM Treasury. The forecasts reported in August 2018, Ofcom's data cut-off date, show the base rate was expected to increase from an average of 0.64% in 2018 to 1.71% by 2021, an increase of more than 100bps. More recent forecasts from November 2018 also predict a similar increase in the base rate.

[22] A21.31
[23] A21.27 - A21.28

Table 1.7: **HM Treasury Consensus Forecasts of Official Bank Rate**

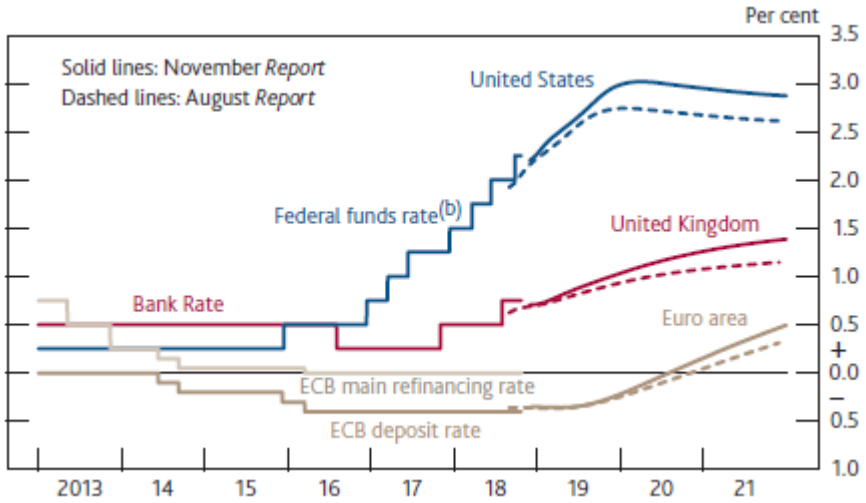
	2018	2019	2020	2021	2022
August 2018 Forecast	0.64%	0.98%	1.42%	1.71%	1.99%
November 2018 Forecast	0.64%	0.98%	1.34%	1.59%	1.84%

Note: Table shows new forecasts of Official Bank of England Base Rate. Source: HM Treasury: "Forecasts for the UK economy, Table M4, August 2018, November 2018.

2.46 This increase in the Bank of England base rate is likely to result in a similar increase in gilt yields given the strong degree of correlation between the base rate and gilt yields in the long-run. We would therefore expect gilt yields to also increase up to 2021, in line with forecasts of the base rate.

2.47 The Bank of England also reports market-implied interest rates up to 2021 based on swap rates. The market is pricing in an increase in interest rates of at least 80bps by 2021, broadly consistent with the forecasts reported by HM Treasury above. Forward-looking evidence clearly points to an increase in interest rates relative to current levels.

Figure 1.8 – Market Implied Path for Interest Rates



Source: *Bank of England Inflation Report November 2018, Chart 1.7, p6.*

2.48 We note Ofcom does present some evidence on forward rates on gilts, which are around -1.5% over the course of the BCMR. Ofcom uses this forward rate evidence to justify setting a risk-free rate estimate above spot rates of around -1.7%. However, as shown in Ofcom's Figures A21.2 and A21.3, forward rates are a poor predictor of future yields. For example, the forward rate for the 5-year gilt in three years' time reported in June 2014 was around 0.1%, compared to an actual 5-year gilt yield in June 2017 of around -2.0%. This discrepancy between the forward rate and the actual yield can be consistently observed in the data Ofcom presents.

2.49 The evidence above on the future path of interest rates suggests that Ofcom's position, that rates are unlikely to revert back towards pre-crisis levels for the foreseeable future, is incorrect. In fact, interest rates have already started to increase and are predicted to continue to do so up to 2021 by around 80-100bps.

2.50 A further factor that could cause gilt yields to increase up to 2021 is higher sovereign risk due to Brexit. Rating agencies have already downgraded UK's sovereign credit rating due to Brexit,[24] and have highlighted risks of further downgrades depending on how risks associated with Brexit unfold. Any further downgrades to UK's sovereign rating will result in higher gilt yields, and therefore a higher risk-free rate. Ofcom has not factored in the risk of such a rating downgrade in its risk-free rate estimate, and therefore its estimate does not reflect potential scenarios that could affect market interest rates.

Short-term averages lead to volatile risk-free rate estimates over time

2.51 We also consider Ofcom's change in approach to using short-term averages results in unnecessary regulatory instability. By definition, short-term averages include fewer data points than long-run averages, and hence they are more volatile over time. Using short-term averages could then result in large changes in the risk-free rate estimate across regulatory decisions, and even between a consultation and final decision. Ofcom previously accepted this argument when using long-run averages, as it noted "using averages avoids putting too much weight on spot rates which may be volatile and avoids large swings from one regulatory decision to the next".[25]

2.52 These arguments continue to be as relevant as they were before. Regulatory stability encourages investor certainty and incentivises investment. We see no reason for Ofcom to now shift away from long-run averages, which are the most reliable method for ensuring stable risk-free rate estimates over time. For this reason, the risk-free rate should be estimated on the basis of long-run averages, in line with the approach taken by Ofcom in its March 2018 WLA decision (a matter of months ago).

Risk free rate conclusion - Ofcom proposes to use shorter-run averages of gilt yields, but this will create unnecessary uncertainty for investors. Longer run averages are less volatile and reduce uncertainty. Whilst long-run historical averages suggest a real risk-free rate against RPI which is slightly below zero, interest rates are set to increase over the period. Given this, Ofcom's March 2018 real-risk free rate estimate of 0% remains appropriate.

Asset Beta

2.53 Ofcom has lowered its estimate of the 'Other UK Telecoms' asset beta from 0.73 to 0.65, driven by a reduction in the empirical beta estimates for UK and European telecoms companies. Ofcom continues with a beta disaggregation approach, where it estimates the BT Group beta first, and then disaggregates it into three constituent elements: 'Openreach Copper Access', 'Other UK Telecoms' and 'Rest of BT'. Ofcom considers the 'Other UK Telecoms' beta is the most appropriate for capturing the risk associated with BT's business connectivity markets. With respect to Ofcom's beta analysis, we have considered the following:

[24] Financial Times (22 September 2017): "UK downgraded by Moody's amid Brexit pressures".
[25] A21.24

- Ofcom's estimate of the BT Group beta;
- The appropriateness of using the 'Other UK Telecoms' beta for business connectivity markets;
- Ofcom's beta range for 'Other UK Telecoms'; and
- Implications of Ofcom's beta estimate for 'Other UK Telecoms' on betas for 'Openreach Copper Access' and 'Rest of BT'.

BT Group Asset Beta

2.54 Ofcom's estimates BT Group's asset beta as 0.71, a reduction from 0.78 in its 2018 WLA statement. Ofcom presents rolling 2-year and 5-year beta estimates, and notes that BT's 2-year beta dropped sharply in June 2018, and attributes it to a 'referendum effect', where volatile data around the June 2016 referendum drops out of the two-year estimation window. Because of the degree of uncertainty associated with the referendum and its associated impact on BT's beta, Ofcom has moved to 5-year estimation windows, which it considers "*strikes a better balance between regulatory stability and efficient price and investment signals*".[26]

2.55 We agree with Ofcom's adoption of a 5-year estimation window in light of the impact of Brexit on BT's beta. When setting a beta for a future regulatory period, market volatility associated with atypical market events could skew historical beta estimates such that they do not reliably capture forward-looking risk. By extending the estimation window from two to five years, Ofcom places less weight on these atypical events, and hence its beta estimate is less likely to be biased.

2.56 The limitation of extending the estimation window to five years is that it places less weight on recent market information, and hence the beta estimate may not reliably measure the market's current perception of a firm's systematic risk. Ofcom has to balance its view of the estimation window at each regulatory review to take account of both the current market view of systematic risk as well as adjusting for atypical events that skew beta estimates temporarily.

2.57 At future regulatory reviews, Ofcom will continue to evaluate whether the decline in BT's beta due to the referendum effect is reflected in BT's beta. Ofcom's consultant, NERA, argues that the decline in BT's beta could be due a 'foreign earnings' effect. NERA hypothesises that UK-focused companies in the FTSE All Share index underperformed the index because of sterling depreciation following the Brexit vote. As a result, their beta fell when estimated against the FTSE All Share Index. NERA presents evidence of declining asset betas for BT, TalkTalk and Sky following the Brexit vote, all of which are primarily UK-focused, whereas the beta for Vodafone, which is internationally diversified, remained largely unaffected.

2.58 The implication of NERA's analysis is that if sterling appreciates in the next few years, UK-focused companies should outperform the FTSE All Share Index, and hence their betas should increase. Ofcom should allow some headroom in its beta estimate to allow for the risk of future changes in the exchange rate. In such settings, Ofcom should err on the side of caution and select a beta above the mid-point of its range to avoid the

[26] A21.100

risk of selecting too low a point estimate, thereby harming investment incentives.

Using the 'Other UK Telecoms' beta for Business Connectivity Markets

2.59 After estimating the BT Group beta, Ofcom disaggregates it into 'Openreach Copper Access', 'Other UK Telecoms' and 'Rest of BT'. Ofcom argues the 'Other UK Telecoms' beta appropriately captures the risk associated with BT's business connectivity markets, and estimates a range of 0.55 to 0.75, selecting a point estimate at the mid-point of the range. Ofcom's point estimate of 0.65 is a reduction from its WLA statement estimate of 0.73.

2.60 Ofcom's beta point estimate of 0.65 does not adequately capture the systematic risk associated with BT's business connectivity markets. As Ofcom notes in its consultation document, 'Other UK Telecoms' includes a wide range of BT services, including business connectivity markets, mobile, fixed retail services, TV and other retail services. Ofcom makes no distinction in risk between each of these different elements.

2.61 In estimating the beta for BT's business connectivity markets, Ofcom has resorted to disaggregating BT Group's asset beta as a pragmatic approach to assessing risks associated with individual regulated markets. Although there are no pure-play listed comparators for these services, under this beta disaggregation approach, each of Ofcom's constituent elements are not comprised of services that all have the same risk. This is not appropriate. Ofcom argues that the constituent elements in 'Other UK Telecoms' face similar risk because (1) they all rely on the same fixed telecoms networks, and hence have similar degrees of operational gearing, and (2) because they involve sales to customers who can scale demand in response to changes in wider economic conditions. However, we disagree with Ofcom's reasoning on both counts.

2.62 The different business segments in 'Other UK Telecoms' do not all rely on the same fixed networks. Although business connectivity markets rely on fixed networks, with high fixed and sunk cost (resulting in higher operational leverage), not all retail markets do. For example, BT's mobile revenues are classified under 'Other UK Telecoms', and rely principally on mobile network infrastructure, which typically has lower fixed and sunk costs than fixed networks, and hence has lower operational leverage. Even for BT's fixed line retail services, which are also classified under 'Other UK Telecoms', these revenues rely on wholesale inputs that vary by the volume of customers served, implying that fixed line retail costs are largely variable and operational leverage is low. Therefore, in comparison to business connectivity markets, operational leverage for mobile and fixed retail services are much lower, and so beta risk for business connectivity markets should be higher for mobile and fixed retail services, all else being equal.

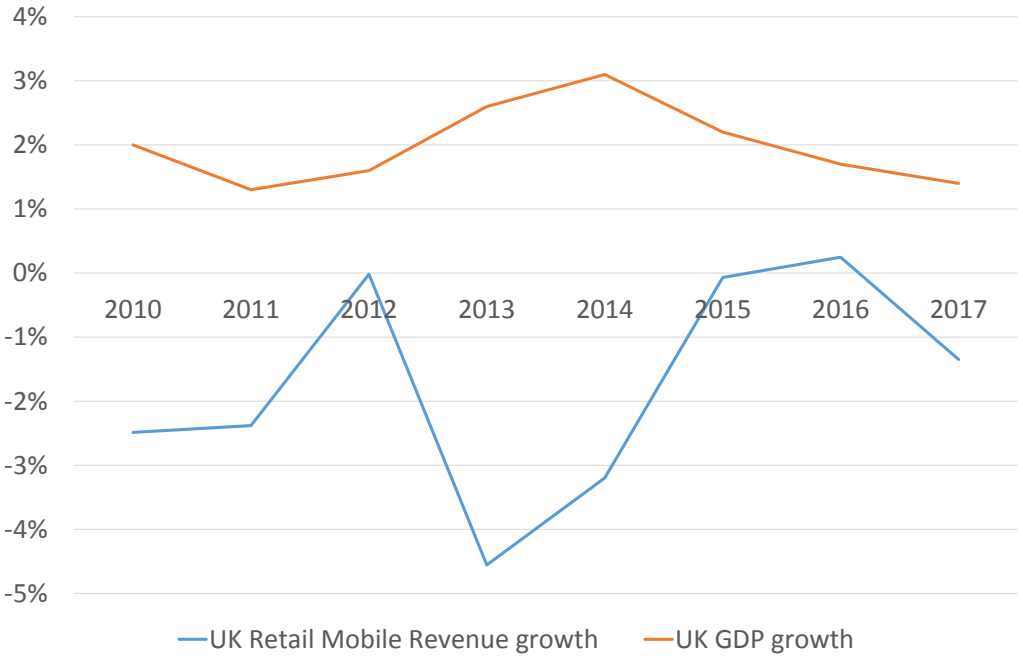
2.63 We disagree with Ofcom's suggestion that customers for all the different services in 'Other UK Telecoms' can scale demand to a similar degree in response to changes in macroeconomic conditions. The degree to which customers scale demand in response to changes in the economy depends on their income elasticity, (i.e. the sensitivity of their demand o changes in income). Within 'Other UK Telecoms', demand for business access services are more likely to vary with changes to the economy than demand for fixed retail or mobile services, because business customers tend to be more sensitive to changes in the economy than residential customers of fixed or mobile services. Ofcom alludes to this when comparing the relative risk of leased lines with Openreach copper

access:[27]

> *"Wholesale leased lines revenue is also likely to be more variable due to volume changes, whereas revenues from local access connections – particularly to residential properties – will typically vary less with the economic cycle"*

2.64 The lower volume risk associated with mobile telecoms is shown in Figure 1.9, which highlights the insensitivity of UK retail mobile revenue growth to changes in UK GDP growth, pointing to low income elasticity of demand. In fact, the correlation coefficient over the period from 2011 to 2017 is negative, potentially suggesting countercyclical movements in UK mobile revenue growth. The evidence demonstrates that investors would expect mobile services to face lower volume risk than business connectivity markets.

Figure 1.9 – Trend in UK retail mobile revenue growth is insensitive to UK GDP growth



Source*: Ofcom Communications Market Report 2014-18, Office for National Statistics; Note: UK retail mobile revenues are converted to real CPI prices. UK GDP growth represents Q on Q4 growth for the 4th quarter in each year.*

2.65 We therefore conclude business connectivity markets are likely to be more risky than the other services categorised under 'Other UK Telecoms', both because they face higher operational leverage and because demand for them is more sensitive to changes in macroeconomic conditions. Our comparison of relative risk of individual services that are categorised under 'Other UK Telecoms' is summarised below.

[27] A21.117

Table 1.10 - Summary of Relative Risk across Services in 'Other UK Telecoms'

	Business Connectivity Markets	Fixed Line Retail Services	Mobile Retail Services
Operational leverage	High	Low	Medium
Volume Risk	High	Medium	Low

2.66 Further, Ofcom's beta analysis ignores the fundamental risk profile of business connectivity markets, and does not address why beta risk has declined compared to its BCMR decision two years ago. NERA presents volume risk for leased lines between 2011 and 2018, which shows broad stability both in monthly variances in leased lines and in the ratios of actual volumes to forecast volume. This points to no change in overall volume risk for leased lines compared to two years ago.

2.67 Moreover, BT is still exposed to volume risk under Ofcom's BCMR consultation proposals, just as it has been in the past under price controls which do not flex with volumes. Given this, and in the absence of any reasoning to the contrary, we do not see any justification for Ofcom to lower its beta estimate from its 2016 BCMR decision.

2.68 In recognition of differences in risk between different segments within 'Other UK Telecoms', Ofcom should select a beta estimate for business connectivity markets above the mid-point of its range of 0.55 to 0.75 for 'Other UK Telecoms'.

Ofcom's choice of comparators to estimate the beta for 'Other UK Telecoms'

2.69 Ofcom's beta range for 'Other UK Telecoms' is informed by beta estimates for UK listed telecoms operators and European listed telecoms operators.

2.70 Ofcom begins by estimating an average UK telecoms operator beta of 0.62, which incorporates betas for TalkTalk, Sky and Vodafone. However, Ofcom then notes that Sky's beta has been depressed since early 2018 because it has been subject to bid speculation for an extended period, which means it should be excluded from the UK comparator set. We agree with Ofcom that Sky should be excluded from its comparator set. Bid speculation leads to a company's share price being affected by temporary market speculation, and hence the resulting beta estimate does not capture the true covariance with the market. Excluding Sky increases the average UK telecoms beta to 0.66.[28]

2.71 Ofcom also presents empirical beta estimates for European listed telecoms operators, estimating a range of 0.39 to 0.66 against the FTSE All Europe Index and 0.43 to 0.74 against the FTSE All World Index. Our analysis suggests that NERA has not estimated the betas of some of these European comparators against an appropriate reference index.

2.72 As part of the analysis of asset and equity betas for BT Group, NERA used a FTSE All-

[28] Sky has been delisted from the London Stock Exchange since 7 November 2018. Ofcom can therefore no longer inform its beta estimate based on Sky, and we expect its updated beta estimates for UK listed telecoms operators in its BCMR statement to only refer to TalkTalk and Vodafone. Source: https://www.lseg.com/sites/default/files/content/documents/MARKET%20NOTICE%202018-067%20Delisting%20of%20SKY%20Plc.pdf

Europe benchmark for the European comparator sample. Overall, this approach is appropriate for the European comparator sample. However, we note that the European comparator sample includes a number of non-euro quoted companies (namely Telenor, Swisscom and Tele2). It is not clear if the currency differentials for these companies have been accurately accounted for.

2.73 Therefore, we have re-estimated the equity betas for Telenor, Swisscom and Tele2 benchmarking against the relevant domestic index and calculated the asset beta on the basis of levels of gearing reported by NERA.[29] The results are presented in Table 1.11 below.

Table 1.11 – Asset Betas for Telenor, Swisscom and Tele2 when estimated against appropriate domestic reference index

Five-year Asset beta	*Telenor*	*Swisscom*	*Tele2*
NERA	0.51	0.47	0.65
Estimated against domestic index	0.65	0.51	0.69
Difference	**0.14**	**0.04**	**0.04**
Two-year asset beta			
NERA	0.40	0.48	0.74
Estimated against domestic index	0.58	0.54	0.69
Difference	**0.18**	**0.06**	**-0.05**

Note: Oslo Bors Index, Swiss Market Index and OMX Stockholm 30 Index were used to estimate the equity beta of Telenor, Swisscom and Tele2 respectively. The cut-off date is 20 July 2018. The asset betas are derived on the basis of gearing reported by NERA.

Source: Oxera analysis based on data from Bloomberg and NERA (2018), 'Cost of Capital: Beta and Gearing for the 2019 BCMR', 11 October, p. 32, Table 3.9.

2.74 Table 1.11 shows that the asset betas for Telenor, Swisscom and Tele2 are higher on average if they are estimated against an appropriate domestic reference index. As a result of these changes, the top end of the European Telecoms five-year asset beta range increases from 0.66 to 0.69 as the updated asset beta for Tele2 places an upward pressure on that range. The average 5-year asset beta for the European telecoms operators would also increase as a result of this correction to the beta estimation approach.

2.75 We conclude that Ofcom should adjust the empirical evidence it has relied on to inform its asset beta estimate for 'Other UK Telecoms'. Removing Sky from the sample increases the average beta for UK telecoms operators' to 0.66 and adjusting the betas for non-Eurozone operators to reflect the appropriate domestic reference index increases the top end of the European telecoms beta range to 0.69. Both of these estimates are higher than Ofcom's beta point estimate for 'Other UK Telecoms' of 0.65. Taken with the evidence above comparing leased line risk with other segments in 'Other

[29] NERA (2018), 'Cost of Capital: Beta and Gearing for the 2019 BCMR', 11 October, p. 32, Table 3.9.

UK Telecoms', Ofcom should therefore increase its beta estimate from 0.55 to 0.75.

Implications on beta for 'Rest of BT'

2.76 An implication of Ofcom's approach to disaggregating BT Group's beta is that it must consider whether the beta estimate for 'Rest of BT' is plausible. Rest of BT principally consists of BT's Global Services division, which provides a range of ICT services, such as managed networks, cloud computing and IT consulting.

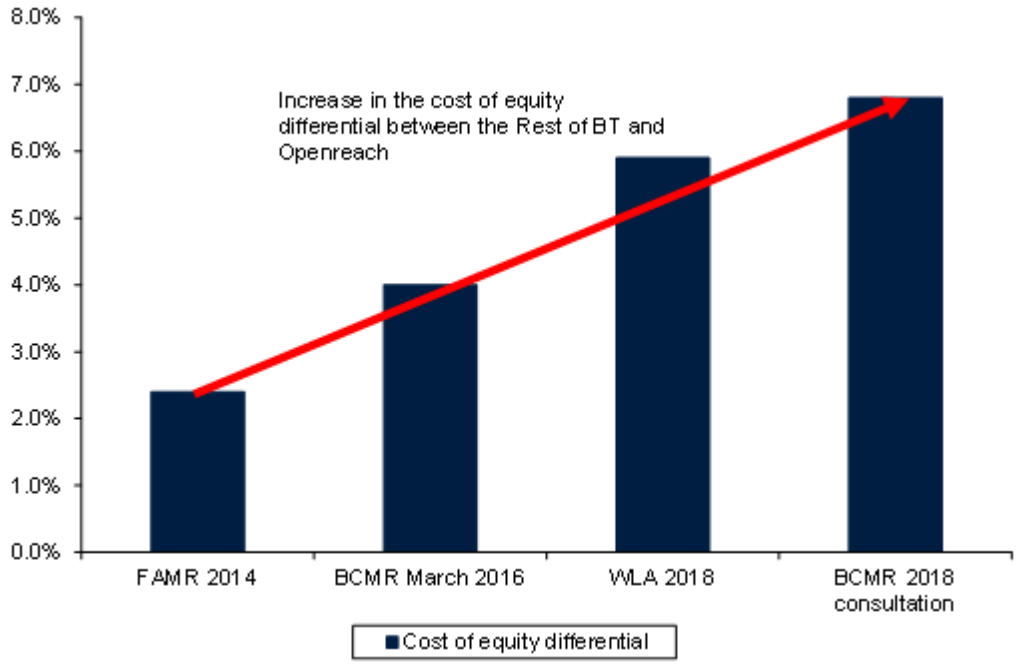
2.77 Ofcom estimates an asset beta range of 0.70 to 1.25 for 'Rest of BT', reflecting the wide range in estimates for global ICT comparators. Ofcom evaluates whether its point estimate for 'Other UK Telecoms', combined with its BT Group beta estimate and 'Openreach Copper Access' beta estimate results in a plausible point estimate for 'Rest of BT'. Its calculations imply an asset beta point estimate of 1.17 for 'Rest of BT', which is well above the average of the range for global ICT comparators (and is in fact at the top end of the range). This provides evidence that the betas for regulated parts are set too low, i.e. had some of the other betas been set higher (e.g. betas for Openreach or 'Other UK Telecoms'), then the residual beta for 'Rest of BT' would have been closer to the mid-point of the comparator range.

2.78 Ofcom should also have undertaken a relative risk assessment of 'Rest of BT' versus 'Other UK Telecoms', to determine whether the gap in its asset beta estimates for the two segments is plausible given fundamental systematic risk drivers. 'Rest of BT', primarily comprised of BT's Global Services unit, supplies voice and data connectivity services as its core product internationally, through products such as BT Connect.[30] These services are similar in systematic risk to many of the services Ofcom categorises under 'Other UK Telecoms'. For example, Ofcom categorises retail fixed voice services in 'Other UK Telecoms', which includes voice services provided to UK enterprise customers. The systematic risk for voice services provided to UK enterprise customers is likely to be similar to voice connectivity provided by Global Services to international customers. Moreover, Ofcom has not shown any evidence of Global Services having higher operating leverage than 'Other UK Telecoms' to explain its higher asset beta for Global Services. The gap in Ofcom's beta estimates for 'Rest of BT' and 'Other UK Telecoms' is therefore not supported by an assessment of relative risk.

2.79 Figure 1.12 shows the difference in the determined cost of equity for 'Rest of BT' and Openreach across Ofcom's recent determinations.

[30] BT Connect includes a set of services that connect customers to their people, their customers and to the cloud. They include hybrid IP, Ethernet and internet virtual private network services. Source: BT Group plc, Annual Report 2018, p94.

Figure 1.12 - Equity betas – Ofcom final determinations on cost of equity in recent reviews



Source: Oxera analysis based on Ofcom regulatory precedent

2.80 We consider that Ofcom's latest determinations have set the disaggregated betas incorrectly, such that the gap between the beta estimates for 'Rest of BT' and Openreach is now implausibly large.

2.81 An asset beta of 0.70 for 'Other UK Telecoms' combined with Ofcom's beta estimates for BT Group and 'Openreach Copper Access' would imply an asset beta of 0.95 for 'Rest of BT'. This resulting estimate for 'Rest of BT' is much closer to the mid-point of the range for global ICT comparators (0.70 to 1.25) and ensures greater consistency of Ofcom's beta estimates in the round.

Asset beta conclusion - We consider Ofcom's asset beta estimate for 'Other UK Telecoms' of 0.65 is too low, primarily because it does not account for the higher risk faced in business connectivity markets than in other segments comprising 'Other UK Telecoms'. An asset beta of 0.70, equal to Ofcom's 2016 BCMR estimate is more appropriate, as there has been no fundamental shift in systematic risk for business connectivity markets over the last year. We also find Ofcom's implied asset beta of 1.17 for 'Rest of BT' implausibly high, because it is not based on an assessment of relative risk between BT's different business segments. Our implied asset beta estimate of 0.95 for 'Rest of BT' is more consistent with empirical evidence for comparators and an assessment of relative risk.

Cost of Debt

2.82 We agree with Ofcom's change in approach to the cost of debt which is to use the actual cost of debt plus a forecast for the cost of new debt issued over the forecast period. As Ofcom notes, the use solely of forward-looking debt costs would not allow an efficiently financed firm fair opportunity to recover efficiency incurred costs in the current circumstances. We do however suggest that Ofcom updates its estimate of the cost of new debt in the Statement as yields on BBB bonds have been increasing since August 2018 (the cut-off point in Ofcom's data as in Figures A21.9 and A21.10).

2.83 We note that Ofcom should increase its risk-free rate estimate from -1.25% to 0.0% (see paragraph x). Because the cost of new debt is estimated as the sum of the risk-free rate and the debt premium, an increase in the risk-free rate would increase Ofcom's cost of new debt estimate from 2.9% to 4.2%.[31] Consequently, Ofcom's overall cost of debt estimate would also increase from 4.0% to 4.2% (once the cost of existing debt is also taken into account).

[31] Cost of new debt = Nominal risk-free rate + Debt premium. The nominal risk-fee rate equals the sum of the real-risk free rate of 0% and the RPI inflation estimate of 2.9%. The debt premium equals 1.3%, based on Ofcom's estimate. Source: A21.77.

A3 Regulation of BT core nodes (A3)

3.1 This Annex raises a number of specific issues important to BTs downstream business units:

- A pragmatic solution is needed to avoid the regulation of some core connections that were not regulated under the 2017 Legal Instruments.[32]
- Cablelink data provided by BT appears to be missing from Ofcom's geographic market analysis, likely resulting in the unnecessary regulation of a number of BT exchanges and we ask Ofcom for a re-assessment using the best available data to correct for this.
- The proposed re-regulation of a number of exchanges since the Temporary Statement is inconsistent with the threshold for regulation having changed from three to two Principal Core Operators (PCOs). We are asking that – where work has begun on building connectivity to these exchanges – these circuits should be exempted from the proposed re-regulation.
- BT understands that under Ofcom's proposals, connections between BT exchanges and non-exchange buildings would not be regulated as they are not listed in Schedule 6. We would welcome Ofcom's confirmation that under its proposals regulation would not apply to connections between BT exchanges and buildings not listed in Schedule 6.

A pragmatic solution for core connections not regulated under the 2017 Legal Instruments

3.2 Ofcom have taken an exchange based approach to geographic market definition of the inter-exchange connectivity market.

3.3 As Ofcom state in paragraph 3.13 of the Consultation, demand for interexchange connectivity '*comes from telecoms operators that need to carry aggregated traffic between BT exchanges to reach their own network*'[33]. This approach to market definition does not capture core connections[34] accurately. If implemented it would adversely impact BT's existing core network significantly, without bringing any benefits to CPs. As explained in more detail below, this is because:

- Firstly, CPs generally do not require access to BT core nodes or connections as they backhaul traffic to their own core network;
- Secondly, non-BT CPs do not locate core nodes within BT exchanges and so cannot derive benefit from the proposed regulation of some BT core connections; and

[32] Ofcom, Business Connectivity Markets, Temporary SMP Conditions in relation to business connectivity services, 23 November, 2017

[33] BCMR 2018 Consultation, para 3.13

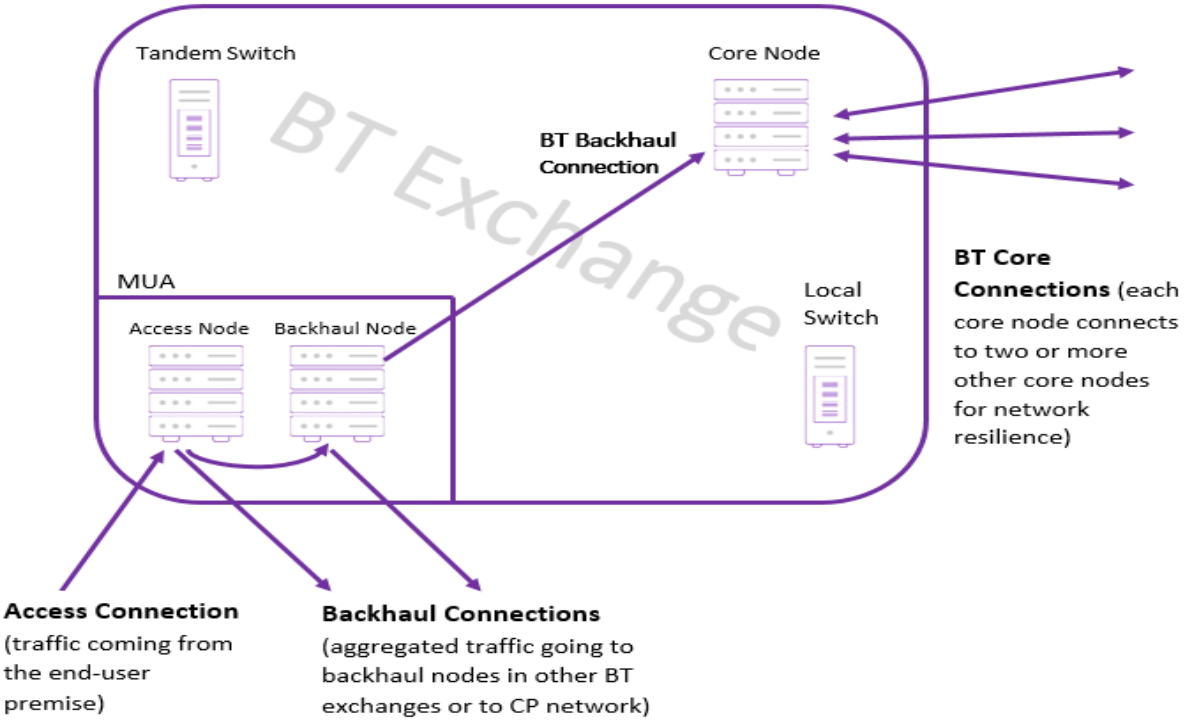
[34] BCMR 2018 Consultation, para 3.7 '*Core connections (and nodes) may transport more communications services due to aggregation of backhaul traffic and generally have higher capacity than backhaul connections (and nodes). Core nodes are typically located in a city of significant population within the geographic area covered by the network. Core nodes typically route (or switch) between other core nodes, and act as points of connection to other networks. Backhaul and access aggregating nodes support progressively smaller areas and populations and may also act as points of connection to other networks.*'

- Thirdly, regulation of these core connections would cause significant network disruption and reduce the reliability of BT's core network.

3.4 Ofcom's approach assumes CPs '*need to carry aggregated traffic between BT exchanges to reach their own networks*'[35]. In practice, CPs do not need access to the whole exchange to backhaul aggregated traffic - they only require access to the multiple user area (MUA).

3.5 As Ofcom acknowledge[36], where there is SMP, CPs rely on Openreach regulated products to backhaul aggregated traffic to their own core network from BT exchanges. CPs therefore only require access and backhaul connections in order to aggregate traffic from the end-user's premise to their own network – all of which is contained in the MUA.

Figure 2.1: Stylised illustration of the topology of a BT



3.6 Figure 2.1 above shows that the topology of the exchange is far more complex, with BT core nodes, local switches and tandem switches all co-located in the exchange, along with the MUA.

3.7 BT core nodes are located elsewhere in the exchange, not in the MUA. Non-BT CPs do not get, nor require or benefit from, access to BT core nodes and thus BT's core connections because CPs do not require access to BT's core network (and if the relevant exchange is regulated, can already obtain backhaul on regulated terms from Openreach from the MUA[37] as shown in figure 2.1).

[35] BCMR 2018 Consultation, para 3.13.
[36] BCMR 2018 Consultation, para 7.7.
[37] BCMR 2018 Consultation, para 7.41.

3.8 Therefore some BT core connections have become regulated simply because they are co-located in an exchange where PCOs have little or no backhaul presence rather than on the basis that the core connections themselves are in demand and uncompetitive.

3.9 We believe that at least [✂][38] core nodes could become subject to SMP regulation under Ofcom's proposals for the Inter-exchange connectivity market. Table 2.2 sets out the list of core nodes that either historically had an exemption from an equivalence of input (EOI) obligation (Core Nodes) or were deemed to be competitive under the previous market review (Competitive Core Nodes). Under Ofcom's proposals in this BCMR, it appears that core nodes that were previously exempt from EOI[39] could now be subject to this obligation and core nodes previously deemed to be competitive could now be regulated.

Table 2.2: BT Exchanges where increased regulation is proposed compared to the 2017 Temporary Statement[40]

[✂]

3.10 The regulation of connections between BT core nodes would require BT to unnecessarily re-engineer parts of its core network to consume Openreach inputs, increasing [✂]. Ofcom has not identified any customer or competitive benefits of imposing such a requirement. As connectivity between these and other BT core nodes has never been subject to regulation, BT has designed its core network to create product characteristics that cannot be replicated using current Openreach products. [✂].

3.11 BT core nodes have been located in exchanges to give maximum geographic coverage and to maintain high levels of service availability to all regions of the UK – for example by providing [✂]. Regulating BT's core nodes would have impact beyond these nodes themselves, driving re-engineering of core network connectivity and [✂]

3.12 In addition, Ofcom's proposals would mean that BT's core network would have to use two management systems; one for BT and one for Openreach. This will unnecessarily complicate fault management of BT's core traffic.[41]

3.13 We believe that a pragmatic solution is possible. In previous market reviews, Ofcom have provided BT with an exemption from EOI obligations for core nodes that did not fall within the deregulated Competitive Core Market[42]. This enabled BT to operate a core network without a requirement to consume Openreach inputs. A similar approach

[38] We note that core nodes at [✂] have been included as uncompetitive exchanges despite not being exchanges. Including these, we believe [✂] core nodes could be re-regulated.

[39] Following the removal of the exemption from the legal instruments: Condition 4.2 of the 2017 BCMR Legal Instruments includes reference to a specific exemption for core connections which is not included in the 2019 BCMR Legal Instruments.

[40] As set out in Ofcom's 'Business Connectivity Markets, Temporary SMP conditions in relation to business connectivity services' (23 November 2017). Annex 1, Schedule 20 (Core Nodes) and Schedule 22 (Competitive Core Node).

[41] Because Openreach inputs would be fault managed by Openreach systems and not BT systems, BT would not have end-to-end visibility of its core network and this would result in such complexity when fixing faults.

[42] As detailed in the BCMR 2016 Legal Instruments, 4.2 (b), p16 '*The obligation in Condition 4.1 to provide network access on an Equivalence of Inputs basis shall not apply to: (b) a Backhaul Segment connecting:(i) the operational building of the Dominant Provider which is a Core Node and another Core Node;*
(ii) the operational building of the Dominant Provider which is a Core Node and a Competitive Core Node; or
(ii) two operational buildings of the Dominant Provider within a Trunk Aggregation Node;'

that extends to include the 'Competitive Core Nodes' that now sit in uncompetitive exchanges should be adopted again. This would ensure BT will not need to consume Openreach inputs for its core connections. Ofcom could adopt a similar and pragmatic solution in this review. We ask that Ofcom continues its previous approach and does not require BT to consume Openreach backhaul products for core connections between existing BT core nodes.

3.14 This will enable BT to continue to provide a highly resilient and flexible core for its customers and end-users without affecting Ofcom's objective of providing greater backhaul competitiveness. CPs would not be disadvantaged by this as they would still be able to buy connectivity to their own network as Openreach would continue to be required to make available the appropriate backhaul product.

Missing Cablelink data

3.15 Ofcom has confirmed that both direct and indirect connections provide sufficient constraint on BT, and therefore will impact the competitive status of an exchange. Ofcom note that '*telecoms providers purchasing External Cablelink variants are doing so to connect to PCO's network to receive an interexchange connectivity service'*[43].

3.16 In a statutory information request dated 14 September 2018, Ofcom requested further information on BT's provision of external Cablelink variants. In our response dated 21 September 2018, BT reported sales of a significant number of Cablelink circuits to PCOs, which are connected to a fibre supplied by the PCO.

3.17 We have identified that for 4 exchanges listed in Schedule 6 as 'BT only' exchanges BT in fact supplied Cablelink circuits to other PCOs. As a result we believe Ofcom's analysis underestimates the PCO presence at BT exchanges and it is essential that Ofcom updates its model for its final decision[44]. We are asking Ofcom to include this information in its analysis and expect it to lead to a small but significant number of exchanges being reclassified.

3.18 Finally, we believe Ofcom has used MDF identifiers ('ID') as references to buildings. However an MDF ID references an MDF within a building and there could be more than one MDF in a building. This therefore means there is no clarity as to whether an exchange is deregulated or not in some buildings where there are multiple MDFs. For example, [✂] MDFs are housed in the same building. However, Ofcom's list of exchanges only includes [✂] and not [✂]. It would be helpful if Ofcom could clarify that its intention is that list refers to the whole BT building/site with both exchanges, and not just the part of the building dedicated to serving the Roath area (in this example).

[43] BCMR 2018 Consultation, para 7.53.

[44] In Annex 15 of the BCMR 2018 Consultation Ofcom state their intention to gather more information from purchasers of external cablelink and BT Egress and this may change the number of BT exchanges subject to regulation.

Proposed re-regulation of exchanges since the Temporary Statement

3.19 There are a number of exchanges where, in the 2018 BCMR consultation[45] Ofcom proposes BT has SMP while, in the 2017 Statement[46], Ofcom found these same exchanges to be competitive; this despite the fact that Ofcom proposes to change the threshold for regulating exchanges from BT+3 Principal Core Operators ('PCOs') in the 2017 Temporary Statement to B+2 PCOs in the 2018 BCMR consultation. While we agree that the threshold of BT+2 is likely a better reflection of competitive constraints than that applied previously, it is difficult to understand how a lower threshold could result in re-regulation of some exchanges.

3.20 Ofcom's proposals have an adverse impact on BT's core network build as BT has already begun to build to these exchanges using core connectivity for new services[47] and some of this is near completion. The lead time to convert this to an Openreach backhaul based solution will result in delays.

3.21 As outlined above, a pragmatic solution is possible. We believe that where deregulation under the 2017 Statement has led to increased core build to those sites, such connections should also be exempt from EOI obligations.

The status of connections to and from nodes and buildings that do not fall within Schedule 6

3.22 Ofcom have confirmed in its consultation document that the purpose of the inter-exchange market assessment is to establish which connections between BT exchanges are not competitive[48]. This is reiterated in Ofcom's clarification on 19 December 2018, which confirms the dark fibre remedy would only apply to backhaul connections linking BT only exchanges to other BT exchanges.

3.23 BT understands that under Ofcom's proposals, connections between BT exchanges and non-exchange buildings would not be regulated as they are not listed in Schedule 6. This is relevant to BT as a number of EE core nodes and BT operational buildings[49] do not fall within the Schedule 6 list of exchanges. These BT and EE buildings are not exchanges, and they do not contain an MUA area, nor frame to which other CPs would need access to aggregate and collect traffic.

3.24 We would welcome Ofcom's confirmation that under its proposals regulation would not apply to connections between BT exchanges and buildings not listed in Schedule 6.

[45] BCMR 2018 Consultation, table 7.6.
[46] Ofcom, Business Connectivity Markets, Temporary SMP Conditions in relation to business connectivity services, 23 November, 2017, Legal Instruments, Schedule 20.
[47] [✂].
[48] BCMR 2018 Consultation, para 7.41.
[49] As well as all non-BT CP sites.

A4 Data Centres (A4)

4.1 We welcome Ofcom's proposal to deregulate connections between the nodes of third party CPs, carrier owned data centres as well as carrier neutral data centres, but would welcome further clarification on the definition of a data centre and the precise scope of deregulated circuits.[50]

4.2 The list of data centres Ofcom published on 22 December 2018 contains over 900 data centre locations upon which its analysis was based. We understand that this list represents all data centres which Ofcom consider to be competitive.

4.3 We request clarification that under Ofcom's proposals:

- Any connection between a data centre and any BT exchange would not be subject to SMP regulation;
- Any connection between two data centres would not be subject to SMP regulation; and
- Any connection between a data centre and a customer site (which is not a datacentre or exchange) located in an area where Ofcom is proposing to find SMP in the (proposed) business access market would be subject to SMP obligations (and considered as part of the business access market).

4.4 We also note that Ofcom's proposed legal instruments do not contain any references to data centres. For the avoidance of doubt, it would be helpful if the legal instrument made clear which specific types of connections (as per our request for clarification above) are consider to be competitive and therefore not subject to SMP regulation.

[50] BCMR 2018 Consultation, para 7.12 *'Connections between BT exchanges are part of a wider set of trunk connections. This wider set includes trunk connections to and from the network nodes of other telecoms providers (which are presumed competitive because they are part of the telecoms provider's core network, a network that can rival BT's), and carrier owned data centres. We also consider carrier neutral DCs to be presumed competitive …'.*

A5 Deregulation of Traditional Interface Services (A5)

5.1 We agree with Ofcom that the time is right to deregulate legacy Traditional Interface (TI) services. Volumes on the platforms[51] supporting TI services are declining rapidly and maintenance costs rising as platform equipment becomes obsolete. There will come a time when it is no longer sustainable to continue to provide these services, and deregulation is key to allowing a timely managed closure of the underlying platforms.

5.2 In this annex we set out why we support Ofcom's proposals and provide evidence to support its conclusions.

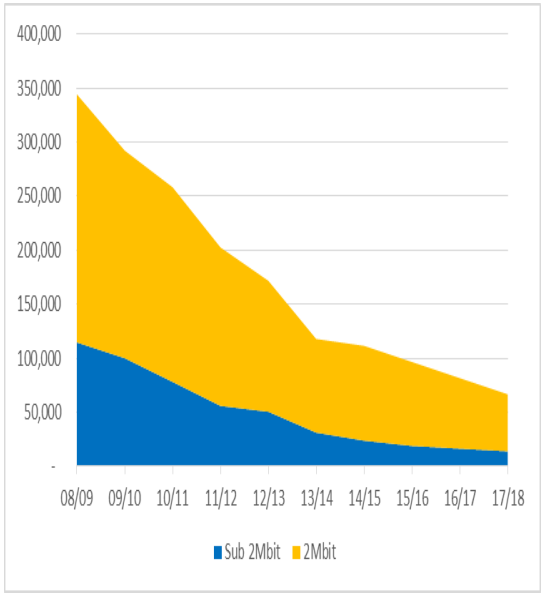
The market for legacy TI services is in long term decline as customers migrate on to more modern alternatives

5.3 Demand for legacy TI services has been in long term decline, with volumes falling by around 80% over the past decade. This trend has continued since Ofcom's last market review. Today, internal BT volumes account for the majority of the market. Figures 4.1a and 4.1b below shows the decline in TI Local Ends from 230K in 2008/09 to 53K in 2017/18 (corresponding to a 16% decline per year over the period).

Figure 4.1: Volumes of low bandwidth PPC Connections and Local Ends

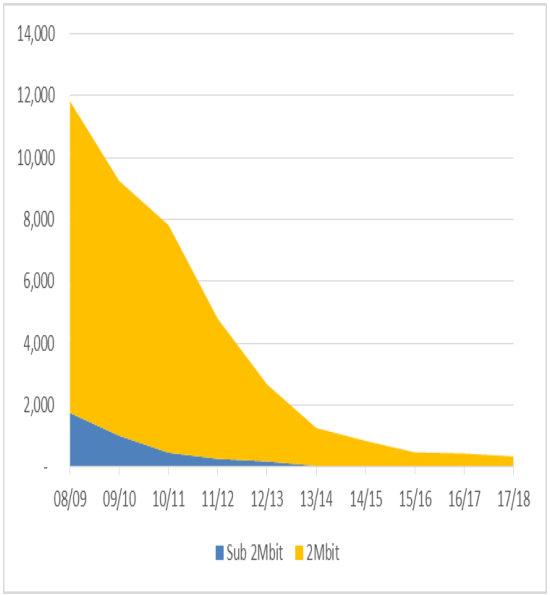
4.1a

Low Bandwidth TI Volumes*



4.1b

Low Bandwidth TISBO Connections Volumes



*PPC Local End volumes

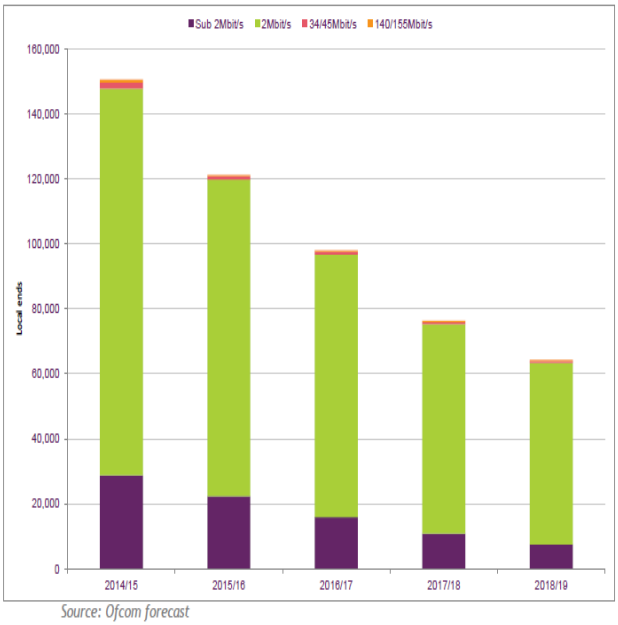
[51] SDH and PDH platforms

5.4 This is in line with Ofcom's forecast set out in its 2016 review, as illustrated in Figure 4.2, and we expect volumes to continue to decline by a further [✂] over the next review period.

Figure 4.2: Comparison of Ofcom forecasts to BT actuals for TI local ends

4.2a[52]

Figure 6.3: Ofcom forecast of TI local ends (installed base by bandwidth)



Source: Ofcom forecast

4.2b

BT actuals for TI local ends (installed base by bandwidth)

[✂]

5.5 The long term decline in the legacy TI platform has been driven by businesses switching to newer alternative technologies which offer lower transport costs, greater flexibility and are often required for new applications. Since Ofcom's last market review, TI customers are now provided with a number of viable alternatives as fibre and Ethernet rollout have become increasingly ubiquitous. FTTP build is likely to continue this trend.

5.6 Additionally, price reductions for Ethernet services have substantially reduced previous price differentials, making switching to Ethernet based services more economically viable. Table 4.3 below sets outs a comparison of the key characteristics of alternatives to a PPC now available.

[52] BCMR 2016 Statement, Volume 2, pg. 142.

Table 4.3: Available alternatives to low bandwidth PPCs

	PPC[53]	*Point- to Point Ethernet (carrier class)[54]*	*National Ethernet Fibre[55]*	*National Ethernet EFM/ GEA[56]*	*Broadband Access (FTTC)[57]*	*Broadband Access (FTTP)[58]*
Contention	Dedicated	Dedicated	Dedicated	Dedicated	Shared	Shared
Distance Limitations	Not Limited	Not Limited	Not Limited	Not Limited	Not Limited	Not limited
Service Availability	99.85%	99.93%	99.93%	99.93%	N/A	N/A
Coverage	99%	99%	99%	EFM 82% GEA 73%	73%	2.83%
Symmetry	Symmetric	Symmetric	Symmetric	Symmetric	At least 2M each way	At least 2M each way
Price	£2,800	£3,498	[✂]	[✂]	£228	£228
Connection	£2,217	£1,850 (£656)	[✂]	[✂]	£54	£104

5.7 While many customers are migrating onto more modern alternatives, those that remain on TI services will be supported by an increasingly ageing platform. The PDH and SDH platform is now used to support only a few 'soon to be withdrawn' services, i.e. PSTN voice and 20C broadband services, in addition to TI services.

5.8 As the platform ages and use of it declines, it is vital to have a clear, managed closure plan that encourages any remaining customers to migrate to alternatives. These platforms are over 30 years old, and sourcing equipment and spare parts for maintenance is becoming increasingly difficult. Significant work is also required to re-engineer existing components to repair and extend their usability.

5.9 Additionally, employees with expertise of the SDH and PDH platforms are at the end of their careers and are now retiring. It is no longer economic to continue to train engineers to manage these services given the decline in usage and that the majority of demand is for newer services.

5.10 At the same time, as costs are not falling in line with declines in volume, unit costs are expected to rise. Figure 4.4 below shows how the rate of decline in TI costs and revenues have fallen between 2014/15 and 2017/18.

Figure 4.4: SDH and PDH platform revenues and costs

[✂]

[53] PPC based upon 2km main link distance (MLD) (current average MLD across installed base – 15km terminating, 4km regional trunk, 2km national trunk)

[54] Point to point EAD assumes 10km MLD excludes connection charge £1,925.

[55] National Ethernet Fibre assumes 2Mbit/s on 100M LA Etherway (3 year term free connection)

[56] EFM assumes 2 Mbit/s on 3 pairs (3 year term free connection); GEA 2Mbit/s on 80:20 Etherway

[57] Broadband Access typical bandwidth inclusive price offered by BT Enterprise is £18-20 per month with Openreach 80/20 rentals at cost of £9.95 per month

[58] For the transition variant of FTTP with Openreach 80/20 rentals at cost of £9.95 per month- Coverage source think broadband for Openreach https://labs.thinkbroadband.com/local/uk

5.11 Whilst variable costs have fallen in line with volumes, fixed costs remain high and are likely to increase further as legacy equipment and expertise become increasingly scarce; costs are becoming increasingly sticky as volumes drop.

5.12 In short, increasing fixed cost must also be shared by a diminishing customer base, as TI customers continue migrate onto other services and PSTN and legacy broadband services are withdrawn. Whilst we do not want customers to experience price shocks, we nonetheless need the flexibility to recover legacy network costs and manage the transition to alternatives.

5.13 Figure 4.5 below shows the trend in BT's returns (ROCE) for the period 2014/15 to 2017/18 alongside Ofcom's forecasts when setting the current charge control. This shows BT's returns to be in line with Ofcom's forecasts and we expect this trend to continue.

Figure 4.5: BT Return on Capital Employed ('ROCE') compared with Ofcom's forecast

[✂]

5.14 With modern alternatives now more widely available at similar prices, we expect customers continue to migrate way from TI services for their business connectivity needs. Continued regulation of the SDH and PDH platform would likely result in artificially maintaining demand for TI services, keeping the network running long past its natural lifespan, impacting reliability and cost efficiency. Therefore we agree with Ofcom that regulation is no longer warranted or justified and support Ofcom's proposal to deregulate TI services.

5.15 To provide existing TI customers with confidence in BT's long term plans, we have made a number of assurances on the future availability, reliability and price of TI services in a letter to Ofcom[59]. In it, we set out the need for a pragmatic regulatory approach in this area and put forward assurances on availability, reliability and price:

- **Availability** – we are committed to continuing to support TI services until March 2021 subject to demand and will provide customers with sufficient notice of withdrawal ahead of a planned 2025 platform switch-off;
- **Reliability** – we will continue to support the platform on a reasonable endeavours basis in order to meet service delivery and quality requirements as set out in PPC contracts;
- **Price** – We would not expect to increase prices by more than CPI+8% per annum to reflect increasing costs. This pricing flexibility will enable BT to cover its costs while also creating the right incentives for customers to migrate.

Ofcom's conclusion that the TI market does not pass the three criteria test is consistent with the approach taken by other NRAs

5.16 We agree with Ofcom's assessment that the market no longer passes the three criteria

[59] Letter from Gerry McQuade to Jonathan Oxley, 3 July 2018 – https://www.ofcom.org.uk/__data/assets/pdf_file/0021/124734/bt-low-bandwidth-wholesale-ti-services.pdf

test, and believe that this is consistent with the approach taken by other national regulatory authorities (NRA) across Europe.

5.17 Estonia, Hungary, Sweden and Austria have all de-regulated low bandwidth TI services on the basis that alternative infrastructures provide sufficient constraint, thus tending towards effective competition. Specifically, the Estonian regulator (ETSA) found that many low bandwidth leased lines users are switching to broadband inputs[60]. Similarly the Hungarian regulator (NMHH) found that effective competition did not stem from a change in market share but from the decreasing average price of higher bandwidth alternatives[61].

5.18 With TI services in the UK experiencing similar constraints from Ethernet alternatives, we agree with Ofcom's assessment that the TI market fails the second criterion of the three criteria test, tending towards effective competition.

[60] EC's comments pursuant to Article 7(3) of Directive 2002/21/EC – C(2014) 9845 – EE/2014/1675

[61] Opening of Phase II investigation pursuant to Article 7 and Article 7a of Directive 2002/21/EC as amended by Directive 2009/140/EC – C(2018) 6084 – HU/2018/2107

A6 Responses to Ofcom's consultation questions and cross references

The following provides cross-references to the relevant parts of the main document in the BT Group response to the PIMR and BCMR ('Main Document'); as well as to the (separate) Openreach responses to the BCMR and PIMR consultations where relevant, that answer Ofcom's question.

Physical Infrastructure Market Review

3.1 Do you agree with our proposed market definitions? We do not agree that there is an economic market in '*telecoms physical infrastructure used to host fixed elements of a network*' given that other physical networks are, and can be used for this purpose, and that the Access to Infrastructure regime is due to be enhanced in 2019 which will increase their availability in future. Such networks can substitute for telecoms networks and therefore ought to be included in the market. See also chapter 2 in the Main Document as well as the Openreach response to the PIMR consultation.
3.2 Do you agree with our proposed SMP assessment? We do not agree with Ofcom's SMP assessment which not only excludes substitution from non-telecom physical infrastructure but also fails to recognise the extent of competition from existing telecom physical infrastructures, whether from Virgin Media or other end-to-end competitors active in HNR areas including the CLA. BT should not be deemed to have SMP in an upstream market where there is no SMP in the absence of the PIA remedy under consideration. In view of this, we do not agree that BT has SMP which justifies UDPA in the CLA at all; and in HNR areas at least for VHB services. See also chapter 2 in the Main Document as well as the Openreach response to the PIMR consultation.
4.1 Do you agree with our proposed general remedies? See chapter 2 of the Main Document and the Openreach response to the PIMR. See also chapter 2 in the Main Document as well as the Openreach response to the PIMR consultation.
5.1 Do you agree with our proposed specific remedies? See chapter 2 of the Main Document and Openreach response.
5.2 Do you agree with our assessment not to impose a dark fibre backstop remedy in this review period? Yes. Introducing regulated dark fibre today is likely to deter investment and innovation rather than support it. Duct and pole access should be allowed to play out before Ofcom even consider imposing a dark fibre remedy as it is likely to undermine the investment duct and pole access is intended to incentivise. See Main Document to the BCMR (chapter 5) and the Openreach response to the PIMR.
6.1 Do you agree with our proposal regarding the level of the financial limit?

See chapter 2 of the Main Document to the PIMR and BCMR and the Openreach response to the PIMR on this question.
6.3 Do you agree with our proposed approach to the recovery of productisation costs? See the Openreach response to the PIMR.
7.1 Do you agree with our proposed approach to regulation of PIA charges? We accept the continuation of prices as set in the 2018 for the next two years. However, a long-term view is needed of the sustainability of duct and pole pricing as demand from new network operators increases as is likely in the period beyond 2021. This should ensure that whatever happens to Openreach's share of active services, there should be a fair opportunity for Openreach to recover the efficiently incurred costs of providing shared access to its physical infrastructure. This is a principle that Ofcom should state up-front so that DPA access takers are aware that the regime operates in this way. See also chapter 2 of the Main Document and the Openreach response to the PIMR.

BCMR: Volume 1

4.1 Do you agree with our proposed approach to product market definition? We do not agree with Ofcom's approach to product market definition as set out in chapter 3 of the Group response to the PIMR and BCMR and in greater detail in the Openreach response to the BCMR.
5.1 Do you agree with our proposed approach to geographic market analysis for CI Access? See above.
5.2 Do you agree with our proposed definition of geographic markets for CI Access? See above.
6.1 Do you agree with our proposed approach to SMP assessment for CI Access in the UK excluding Hull Area? See above.
6.2 Do you agree with our proposed SMP findings for CI Access in each of the geographic markets defined? See above.
7.1 Do you agree with our assessment of inter-exchange connectivity? See Annexes 2 and 3 above and the Openreach BCMR response.
7.2 Do you agree with the proposed market definition? See Openreach BCMR response.
7.3 Do you consider that our list of BT exchanges for de-regulation is correct? See Annex 2 above.
7.4 Do you agree with our list of Principal Core Operators (PCOs)?

See Openreach response to the BCMR.
8.1 Do you agree with our proposal not to regulate the low bandwidth TI services market on the basis that it no longer fulfils the three-criteria test set out in the European Commission Recommendation? We agree with Ofcom's assessment that the market no longer passes the three criteria test. This is consistent with the approach taken by other national regulatory authorities (NRA) across Europe.
10.1 Do you agree with our proposed approach to remedies? See chapters 3, 4 and 5 of the Main Document and the Openreach response to the BCMR.
11.1 Do you agree with the general remedies that we propose? As above.
12.1 Do you agree with the aims and effect of our proposed dark fibre remedy? As above.
12.2 Do you agree with our proposed scope of the remedy? As above.
12.3 What scope do you expect to have for cost savings as a result of the proposed dark fibre remedy? See chapter 5 of the Main Document and the Openreach response to the BCMR.
12.4 How many orders for dark fibre would you envisage placing during the two-year period? See Openreach response to the BCMR.
12.5 Do you agree with our proposed timeline for dark fibre implementation? See Openreach response to the BCMR.
13.1 Do you agree with the specific network access remedies that we propose for CI services at all bandwidths in the business connectivity markets? See chapters 3, 4 and 5 of the Main Document to the PIMR and BCMR and the Openreach response to the BCMR.
14.1 Do you agree with the specific remedies for interconnection and accommodation that we propose? See Openreach response to the BCMR.
15.1 Do you agree with our proposals regarding the application of QoS standards, KPIs, SLAs and SLGs over the period of this review? We welcome Ofcom's decision to review Openreach QoS obligations. It is important that these services standards are scrutinised and remain appropriate for industry. We broadly agree with Ofcom's QoS proposals for the next review period and believe that on the whole they will help to support service delivery to our customers subject to the specific issues Openreach raised in its response to the BCMR consultation. Obligations set out in the last market review have contributed to a step-change improvement in Openreach service level performance. BT customers prioritise service

delivery over compensation, and therefore our focus remains on improving how well we deliver services rather than compensating customers when things go wrong. For BT therefore it is vital that any measures imposed on Openreach are clear, effective and drive the correct behaviour both within Openreach and the industry.

Ofcom's has set out guidance for future negotiation of SLGs in paragraph 15.185 of the Consultation. We are pleased to see this as it provides much needed clarity on costs, such as brand damage, that have previously been in contention due to their intangible nature.

In principle, BT does not believe higher levels of SLGs are effective at improving Openreach service delivery performance. Rather it incentivises gaming of the system. Therefore it is important that the SLGs are not set at too high a level and that only the essential costs are included in setting them.

BT would like to see a number of additional new measures introduced by Openreach to improved visibility and clarity of Openreach delivery. These have been raised at the Ethernet Service Forum:

- "**Radio Silence" reports.** These would give us a meaningful update every 10 days from Openreach. The current set of measures for KCI2/3 on legacy and the equivalent on EMP 1.2/2 currently has a pass or fail measure in place. Once an order has failed there is no measure of by how long this has failed by, so in some cases this could be 2 hours in others 2 months. Adding a continuous cycle time type measure to this would give us a more informed view as to whether remedial action is needed by Openreach.
- **The Stand-alone survey (SAS).** This is a particularly important issue for BT as we use these regularly. Stand-alone survey gives CPs an option to instigate a planning survey by Openreach ahead of a circuit order being placed. If the SAS process has already been used to assess the requirements of the site and planning activities completed, we think it is reasonable for a live order to be expedited through the order process.

16.1 Do you agree with the remedies in the Hull Area that we propose?

NA

BCMR: Volume 2

2.1 Do you agree with the proposed form of charge controls?

See chapter 4 of the Main Document and the Openreach BCMR response.

3.1 Do you agree with each of our proposals in relation to the design of charge controls for active services at 1 Gbit/s and below?

See chapter 4 of the Main Document and the Openreach BCMR response.

3.2 Do you agree with each of our proposals in relation to the design of charge controls or active VHB services?

See chapter 4 of the Main Document and the Openreach BCMR response.

3.3 Do you agree with each of our proposals in relation to the design of charge controls for accommodation services, Excess Construction Charges and Time Related Charges?

See chapter 4 of the Main Document and the Openreach BCMR response.

4.1 Do you agree with our proposals in relation to the design of a charge control for inter-exchange dark fibre? See chapters 4 and 5 of the Main Document and the Openreach BCMR response.
5.1 Do you agree with each of our proposals in relation to the implementation of charge controls? See chapter 4 of the Main Document and the Openreach BCMR response.

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