frontier economics

WLA MARKET REVIEW

Cost of capital for regulated services

13 June 2017

CONTENTS

EXECUTIVE SUMMARY

Ofcom's approach to determining BT's future cost of capital will overstate the forward looking cost of capital for regulated services because:

- it fails to reflect a reasonable forecast of the forward looking risk free rate (RFR); and
- it places disproportionate weight on inappropriate metrics when estimating the asset beta for 'Other UK telecoms'.

These two issues result in the cost of capital used for setting charge controls being overestimated by around 1.1% for 'Openreach copper' services and 1.7% for other regulated services.

Using a more appropriate estimate of the forward-looking RFR and estimates for asset betas which place more weight on information from comparable operators, would result in a cost of capital more in line with Ofcom's objectives.

Ofcom's current approach to determining the risk free rate does not reflect forward looking costs

Contrary to Ofcom's stated intentions, Ofcom's proposed methodology for estimating BT's cost of capital would not result in charge controls that reflect BT's forward looking costs. Ofcom's approach places too much weight on a largely unevidenced assumption that the risk free rate will increase significantly by the end of the next charge control period, reverting to a level above the average for the last decade.

This would imply a reversal of the downward trend in the real returns on risk free assets since the 1980s. Ofcom has consistently dampened this trend in its own cost of capital estimates since 2005, by setting the risk free rate with reference to averages over long periods rather than prevailing spot rates.[1]

Ofcom acknowledges that yields on assets such as index linked gilts, which are often considered as proxies for the RFR, have been lower than its RFR determinations ever since the 2008 financial crisis. However, it justifies using a forecast which is much higher than the current (negative) spot rate:

> *"taking account of the fact that yields are typically positive over most periods for the last century or more."*[2]

The implied assumption that the RFR will eventually revert to values typical over the last century provides little support for Ofcom's estimate of a forward looking RFR at the end of the charge control period (2020/21). In particular, the required rate of increase in the RFR is not supported by:

- the secular downward trend in the risk free rate in developed countries since the 1980s;

[1] Figure A16.6 of the WLA Market Review Consultation illustrates how Ofcom's determinations on RFR have moved further away from contemporaneous market data since 2009. [2] WLA Market Review Consultation A16.25.

- forward rates derived from market data, as assessed by Ofcom; or
- the factors cited by Ofcom as possibly depressing the current level of yields[2], which are unlikely to be reversed by 2020/21.

As a result, Ofcom's estimate of the forward looking RFR is significantly too high, which leads to inflated estimates of both the cost of equity and cost of debt:

- when estimating the forward looking cost of debt, Ofcom combines the backwards looking long term historical average real RFR with a forward looking forecast of inflation, and a corporate debt premium based on recent data. These inputs are inconsistent (temporally) and result in an estimate of the forward looking cost of debt that is significantly higher than Ofcom's own estimate of BT's actual forward looking cost of debt based on direct market data such as forward debt yields.
- in relation to the cost of equity, the incorrect estimate of the forward-looking risk free rate could also lead to an overestimate of the true forward-looking cost of equity.

Ofcom is wrong to implicitly assume movements in BT Group's overall cost of capital reflect changes in the cost of capital for regulated services

Ofcom sets separate costs of capital for two groups of regulated services:

- those used to deliver Openreach's copper based services ('**Openreach copper**'); and
- other regulated services ('**Other UK telecoms**').

For each of these sets of services, Ofcom needs to determine the appropriate asset beta, debt premium and gearing, with the asset beta being the key determinant of differences in the estimated WACC between the groups of services.

Given the lack of directly observable market information or close comparators, Ofcom's determination of the appropriate beta requires it to consider a wide range of evidence and exercise a degree of judgement.

For 'Openreach copper', Ofcom has set the asset beta based solely on comparator data, without reference to recent movements in the estimated BT Group asset beta. This appears reasonable, as movements in BT Group's asset beta are unlikely to be primarily driven by returns from more stable, regulated assets.

However, Ofcom proposes to increase the asset beta for the 'Other UK telecoms' above the level used in Ofcom's previous decision in the Business Connectivity Market and above key comparators for this component, to reflect recent increases in BT Group asset beta. The reasons given by Ofcom for this increase are not justified:

[2] Including credit risk following the EU referendum, Bank of England actions such as quantitative easing and low interest rates, and high demand for index linked gilts from pension funds. WLA Market Review Consultation A16.15

- the increase in the BT Group asset beta is unlikely to be driven by regulated services, given the limited weight of these services;

- while certain UK comparators have shown an increase in asset beta since the last determination, the levels are still well below the estimate proposed by Ofcom; and
- while BT Group overall has a relatively high asset beta compared to its peers, there is no evidence to suggest this is due to regulated wholesale services (which are likely to have inherently lower risk) rather than its other activities such as its retail divisions, pay television and mobile.

Taking these factors above and the evidence presented by Ofcom in the round, an asset beta of 0.65 as a central estimate would appear reasonable for noncopper regulated services.

This document

In this document, we first present our analysis of Ofcom's approach to the risk free rate in Section 1, followed by our analysis of Ofcom's approach to the cost of equity in Section 2. Section 3 sets out our revised estimates of the cost of capital for the regulated services.

1 THE RISK FREE RATE

1.1 Ofcom's approach to determining the RFR

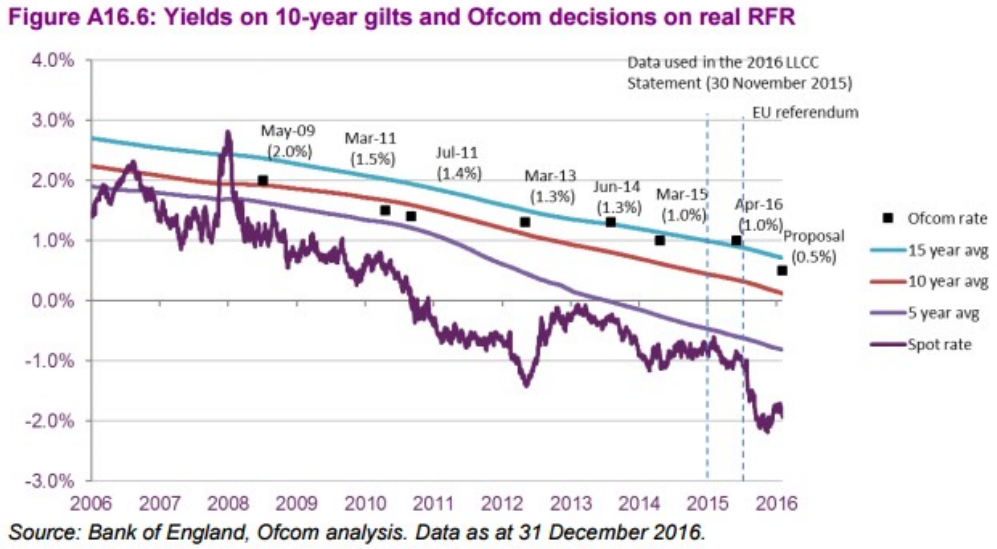
Ofcom explicitly states in its consultation that it is modelling a forward looking cost of capital:

> *"When setting a charge control, we are concerned with estimating the weighted average cost of capital (WACC) on a forward-looking basis. As described in Volume 2 Section 2, we propose using a glidepath to align charges with costs in 2019/20 and 2020/21 (the final year of the control period). Therefore, for modelling purposes, we require an estimate of the WACC in both 2019/20 and 2020/21."*[4]

The risk free rate (RFR) is a central component to Ofcom's estimates of both the cost of debt and the cost of equity, and it is therefore essential that its estimate appropriately reflects forward looking costs. Ofcom's proposed RFR ignores long term market trends that suggest a RFR for 2020/21 will lie significantly below the long run historical average rate.

Ofcom's proposed RFR of 0.5% lies between the 10-year and-15 year average for yields on index linked gilts. This is illustrated in Figure 3 below, which also shows the spot rate RFR and Ofcom's previous determinations of the appropriate RFR for cost of capital decisions. This shows that there has been a continuation of the long term downwards trend in the average RFR since the mid-1990s.

Figure 1 Ofcom's Decisions on Real RFR



Source: WLA Consultation

Ofcom's determinations of the real RFR since 2009 have exceeded spot rates by an increasing margin over time. In 2009 the determination was slightly above the

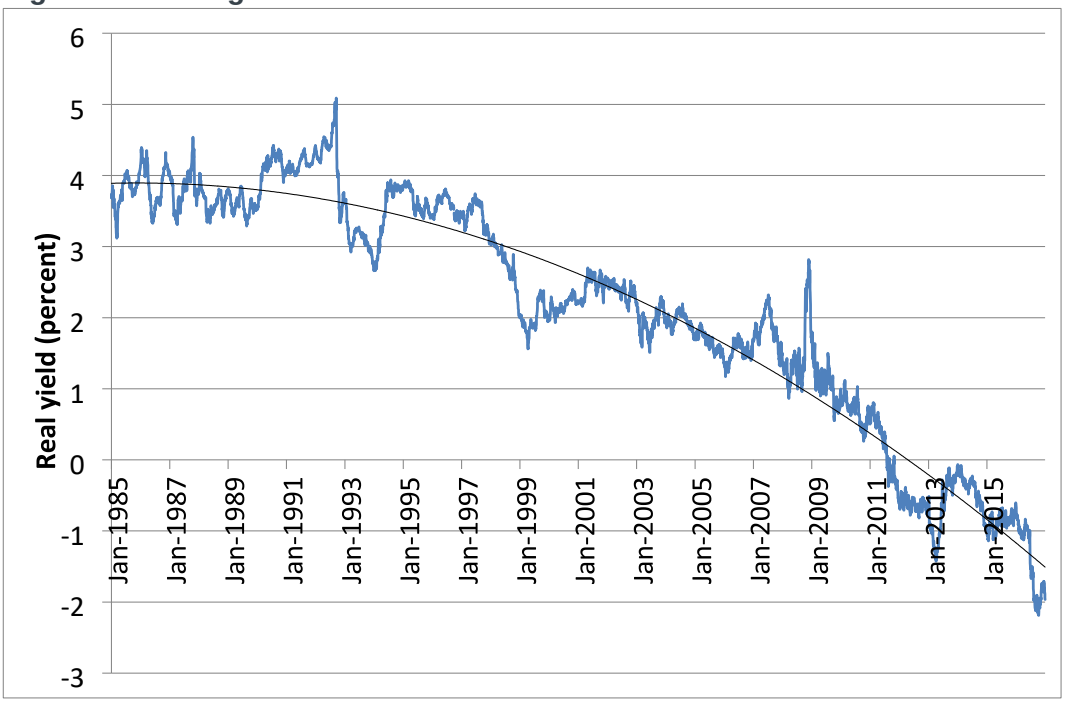
[4] WLA Market Review Consultation A16.1

spot rate, but this difference was consistent with a view at the time that current spot rates were depressed by cyclical effects and that a forward looking rate was above the current spot rate[3]. Since that time, the difference between the spot rate and Ofcom's determinations has widened significantly as Ofcom has relied upon increasingly long-term historical averages that ignore clear trends in the observed data.

Given the long term downward trend, and the fact that yields on index linked gilts have remained significantly below the 5- 10- and 15-year moving averages since the 2008 financial crisis, there is no basis to assume that rates will return to the these averages within the timeframe of the charge control. Ofcom has presented no evidence or forecasts to suggest that these yields, which have been below 0.5% since 2011, will return to pre-2008 levels.

Inspection of a longer time series than presented by Ofcom shows little evidence of a turning point in the downward trend in the real RFR or that there has been any reversion to the mean in this period. This pattern of a long term downward trend is also common across developed countries[4].

Figure 2 Long term real RFR trend



Source: Bank of England

Note: Yield from British Government Securities, 10 year Real Zero Coupon (IUDMRZC) – daily data with quadratic trend fitted

[3] Average rates in the five years leading up to the determination were 2.1%.

[4] See for example Bank of England: Staff Working Paper No. 571 Secular drivers of the global real interest rate, Lukasz Rachel and Thomas D Smith, December 2015

Ofcom cites a number of factors that may have depressed current UK yields on index linked gilts, including credit risk following the EU referendum, Bank of England actions such as quantitative easing and low interest rates, and the high demand for index linked gilts from pension funds. However, it presents no

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evidence that these factors fully explain the current level of yields or that the effect of these factors will be lifted before the end of the charge control period.

It therefore seems highly unlikely that within the relatively short period of the charge control (three years), yields will return to levels above a 10-year average.

In table A16.5 of the consultation document, Ofcom summarises the recent RFR decisions by other UK regulators and the CMA. However, Ofcom cannot rely on this as evidence that its proposed approach is appropriate for setting a charge control for BT.

Ofcom's forward looking approach to determining the cost of capital differs from that of some other UK utility regulators that target returns which reflect a long run view of financing when they determine charge controls. This reflects both the different market structure in these sectors and the fact that these regulators, unlike Ofcom, have statutory duties to ensure that operators can finance their regulated activities.[5]

Ofcom, in its defence of an appeal of a previous WACC decision set out why its approach to setting the cost of capital, may differ from other UK regulators:

> *"Ofcom said that regulators would have a number of different considerations to take into account when implementing charge controls. The precise balance between these various considerations would necessarily vary on the facts of a particular case and according to the particular legal duties of the regulator in question. In deciding on a precise form of regulation in any given circumstance, each regulator must consider which of these interests were relevant, and then balance them against one another, bearing in mind that the different considerations may not all point towards the same outcome. Each regulator in each decision would choose the form of regulation which reflected the appropriate trade-offs in the specific circumstances. It was therefore reasonable to expect a certain degree of variety in regulatory decision-making practice.[6]"*

As such, while comparisons with the approaches and parameters adopted by other UK regulators may provide useful evidence, some differences in approach and the

[5] A so-called financeability duty. See for example Joint Regulators Group (JRG) Cost of Capital and Financeability March 2013

[6] Competition Commission Case 1187/3/3/11 Determination June 2012 Paragraph 2.213

regulatory judgement on the correct level of parameters is to be expected given the different legal duties on regulators.

1.2 Cost of debt

Ofcom's proposed approach for estimating the cost of debt is based on combining estimates of three components:

- the real risk free rate;
- RPI inflation; and
- debt premia.

Compared to an approach based on direct observation of market data on yields, a clear risk of Ofcom's approach is that there will be inconsistencies between the components. Such inconsistencies could result in the estimates being inaccurate or biased.

The table below summarises the values, sources and timescales used to determine the three components used by Ofcom to set the cost of debt. **Figure 3 Consultation proposals on BT Group cost of debt (2020/21)**

Component	Source	Timescale	Value
Risk free rate	Historic yields on index linked gilts[7]	15 years historical data	0.5%
Inflation forecast	Office of Budget Responsibility forecast	Point forecast of end of charge control	3.2%
Debt premia	Historic data on debt spreads	Average over last one and two years	1.0%
Total cost of debt			4.7%

Source: Consultation Table 16.1

Both the forecasts of inflation and recent data on debt spreads may be reasonable for estimating a forward looking cost of debt. However, it is not appropriate to combine these components with a RFR that is based on a long run trailing average, as this assumes a degree of mean reversion in yields that is not supported by the evidence.

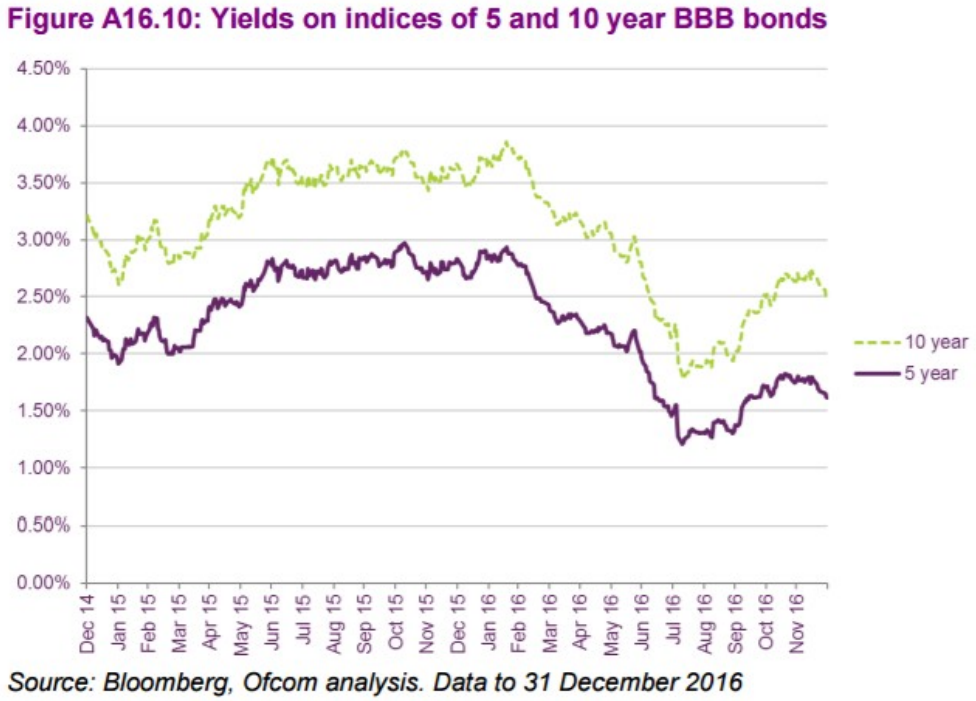
The result of this temporal inconsistency can be shown by comparing the resulting estimate of the cost of debt with actual data. For example the annual change in RPI to December 2016 was 2.5%[8] which, combined with a debt premia of 1.0% and a real RFR of 0.5% would lead to an estimated cost of debt for BT of 4.0%. Ofcom itself shows that yields on comparable corporate debt have been at a much lower level over the past two years than implied by its approach, with current spot

[7] Ofcom presents data on forward yields but these do not appear to feed into the estimates.

[8] https://www.ons.gov.uk/economy/inflationandpriceindices/bulletins/consumerpriceinflation/dec2016#retailprices-index-rpi-and-rpij

rates around 2.5% for 10 year bonds in December 2016, 1.5% lower than the result of combining the December 2016 RPI with Ofcom's estimates of the risk free rate and debt premia.

Figure 4 Yields on comparable corporate debt



Source: WLA Market Review Consultation

Furthermore, when making proposals on setting the cost of debt Ofcom states that it has compared:

> *[…] our estimated cost of debt with the cost of debt that would be derived by considering the weighted average of BT's existing*

> *debt and new debt expected to be issued during the charge control period.*[9]

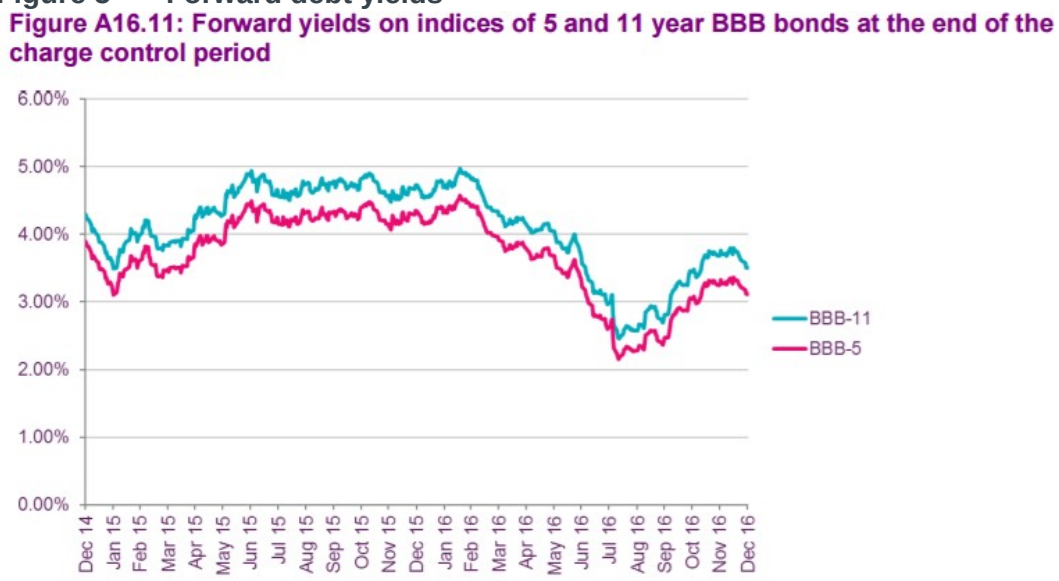
There appears to be no rationale for this approach which directly contradicts the principles set out by Ofcom in its Defence to BT's appeal of the 2012 WBA Decision:

> *Ofcom said that it disagreed in principle with making an allowance for the embedded debt premium.*[10]
>
> *Ofcom said that its approach to its decision on embedded debt was, as mandated by the EC framework, a forward-looking one which allowed only efficiently-incurred costs. The cash liabilities of BT in relation to past periods of economic activity were, it said, by definition not efficiently-incurred forward-looking costs of providing the relevant [WBA] services during the forthcoming charge control period.*[11]

As the EC framework has not changed since this defence, information on the cost of BT's existing debt should play no part in setting the cost of debt.

Instead, Ofcom should rely on its direct estimate of a comparable forward looking cost of debt for BT based on market evidence. Ofcom calculates forward rates for December 2020 (towards the end of the final year of the charge control) in the consultation. These are shown in figure A16.11 reproduced below.

Figure 5 Forward debt yields



Source: WLA Market Review Consultation

[9] Consultation. A16.27

[10] Ibid. Paragraph 2.17

[11] Ibid. Paragraph 2.19

These suggest that an appropriate point estimate for the forward looking cost of debt in the final year of the charge control is between 3.1% and 3.5%.

1.2.1 Conclusion

Ofcom's approach to the RFR leads to Ofcom significantly overstating the forward looking cost of debt. Given that Ofcom is attempting to estimate the future cost of debt and comparable market data can be directly observed, Ofcom should move to an approach based on forward RFR estimates.

1.3 Market cost of equity

In a similar way to the cost of debt, Ofcom builds up the market cost of equity[12] from three components with separate estimates of:

- the real RFR,
- RPI inflation; and
- the equity market risk premium (ERP).

For two of these components Ofcom uses the same estimates as those used to calculate the cost of debt:

- the real RFR based on a long historical time series; and
- RPI based on a forecast for the end of the charge control.

Ofcom considers a range of estimates of the ERP:

- estimates based on historical data on the differentials in returns between the risk free rate (as measured by government bonds);
- survey data;
- a forward looking estimate from the Bank of England dividend growth model (DGM); and
- regulatory precedent.

Despite the fact that Ofcom is setting a forward looking cost of capital, it places greater weight on the estimate based on historical data than the forward looking estimate. Ofcom considers that historical data is a more robust estimate given the long time series available and the high variability of equity returns from year-toyear.

1.3.1 Impact of inconsistencies in time frame

The impact of different timeframes for the ERP depends on which parameters are considered to be stable over the long term.

[12] The cost of equity for the market as a whole, before the inclusion of a company specific asset beta.

- if the ERP is stable over the long term then it is irrelevant whether a forward or backward looking estimate of ERP is used. However, using a backward looking estimate of the RFR will result in an over-estimate of the total cost of equity;
- if the (real) total market return (TMR) is stable over the long term, then internal consistency between the ERP and RFR estimates is more important than whether those estimates are forward or backward looking.

Ofcom considers that the TMR is relatively stable over time, in that changes in the RFR do not feed through into changes in the TMR on a one-to-one basis[13] as reductions in the RFR may be offset by increases in the ERP.

Ofcom does implicitly assume some pass through with a reduction of 0.5% in the estimate of RFR since the BCMR determination which translates into a reduction of 0.1% in the real TMR[14], i.e. an effective 20% pass-through of changes in the RFR.

However, there remains a risk that Ofcom's approach, by relying on a backward looking estimate of the RFR, biases the results in two ways:

- first, even if only a small proportion of the reduction in the RFR is passed through into a reduction in the TMR, the fact that Ofcom's estimate of the RFR is above the forward looking RFR means that the TMR would be overestimated on a forward looking basis; and
- second, if the TMR is assumed to be broadly constant, the decomposition of the TMR between the RFR and the ERP will be incorrect, with the ERP underestimated. Applying the CAPM, this will tend to overestimate the cost of equity for assets with an equity beta of less than one (which applies to Openreach copper).

Substituting Ofcom's RFR assumption with a forward looking RFR of -1.5% (based on the information shown in A16.4) and assuming 20% pass through of reductions in the RFR to the TMR, would result in the following estimates of the ERP and TMR.

Figure 6 Revised ERP and TMR assumptions using a forward looking risk free rate

	Ofcom assumption	Using forward looking RFR	Change
Real RFR	0.5%	-1.5%	-2.0%
ERP	5.5%	7.1%	1.6%
Real TMR	6.0%	5.6%	-0.4%

Source: Frontier

[13] Paragraph A16.19

[14] Consultation A16.75

1.3.2 Conclusion

Ofcom's approach to the RFR will overstate the forward looking cost of equity as long term reductions in the forward looking RFR would likely lead to some reduction in the forward looking TMR and an increase in the ERP.

2 OFCOM'S DETERMINATION OF THE ASSET BETA FOR REGULATED SERVICES

2.1 Ofcom's approach to setting differentiated costs of capital

Since 2005, Ofcom has set different costs of capital for two sets of regulated services:

- Openreach copper based services (primarily MPF and WLR rental); and
- all other regulated services including the assets used to deliver GEA services[15].

Ofcom determines the cost of capital for each of set of services by varying the asset beta with reference to benchmark comparator companies and to a lesser extent by varying the debt premia[16].

2.1.1 Reconciliation to a BT Group cost of capital

Ofcom also determines a cost of capital for a 'Rest of BT' business in order to reconcile an estimate of the overall BT Group cost of capital with the costs of capital of three component businesses:

- 'Openreach copper' which corresponds to the regulated copper based services;
- 'Rest of BT', which corresponds to BTs Global Services division; and
- 'Other UK telecoms', which is determined to have the cost of capital used for the other regulated services and which includes all other operating activities of BT, including the non-copper regulated services.

In its analysis Ofcom does not distinguish the appropriate cost of capital for the non-copper regulated services from the cost of capital for the 'Other UK telecoms' set of activities as a whole. However, there is no *a priori* reason why the cost of capital for the other regulated services should be equal to that of the broader set of services.

2.1.2 Sources of comparators for asset betas

Ofcom considers three sets of comparators to derive asset betas for the regulated businesses: ■ UK network utilities;

[15] The same cost of capital is also used for other charge controls including the Leased Line Charge Control and the Wholesale Broadband Access charge control.

[16] Ofcom keeps the level of gearing constant across businesses and varies the debt premia to reflect the likely debt premia for businesses with similar risk profiles given this level of gearing.

- UK telecoms operators; and
- European telecoms operators.

Ofcom calculates asset betas against three indices; the UK (FTSE All Share); Europe (FTSE All Europe); and a global index (FTSE All World).

2.2 Asset beta for Openreach copper regulated services

Ofcom sets the asset beta for 'Openreach copper' between the average values for 'UK network utilities' and 'UK telecoms' and below that of BT Group, all estimated using the 'home' index (FTSE All Share). Given that there have been few significant movements in the average values of either set of comparators since Ofcom's previous determination of the cost of capital for the Business Connectivity Market Review, Ofcom has maintained the same estimate as in that earlier decision. This appears reasonable in the light of limited new information, given that Ofcom subjectively determines an asset beta within the upper and lower bounds set by the two groups of comparators.

2.3 Asset beta for other regulated services

The process through which Ofcom arrives at a single point estimate for the asset beta for other regulated services is more complex than the approach for the Openreach copper services. There are three stages:

- Ofcom chooses a range in which it believes the asset beta should lie based on the 'UK telecoms' comparators;
- Ofcom then cross-checks this range against the EU Telecoms comparators; and
- Ofcom then picks a point estimate from within this range based on a range of supporting evidence.

Ofcom's point estimate asset beta for 'other UK telecoms' of 0.75 is inappropriately high, given the evidence presented. We outline how Ofcom's treatment of available data is inappropriate, at each stage of its approach, in the following sections.

2.3.1 Determining a range of asset betas based on UK telecoms

Ofcom initially sets the range for the asset beta for 'other UK telecoms' with reference to the asset betas for 'UK telecoms' measured against the FTSE All Share. However, while these comparators are in a relatively tight range between 0.57 and 0.65, Ofcom expands this range significantly, particularly on the upside, to 0.55 to 0.75, with the only justification being that this is a range used in the previous BCMR decision.

Ofcom has explicitly decided that asset betas calculated over two years should be given most weight[17], in order to ensure that asset beta estimates are suitably

[17] See Consultation Document footnote 728

forward looking. As such Ofcom should rely on the most up-to-date point estimates when determining ranges rather than relying on the range that was determined for the BCMR statement using data for the period up to October 2015. This up to date data does not support a point estimate of 0.75.

2.3.2 Cross-check against EU telecoms

For the UK based companies, Ofcom gives greater weight to asset betas estimated against the FTSE All Share index (as the 'home' index) than those calculated against the FTSE All World Index, for example using the beta calculated against the FTSE All Share index to determine the asset beta for BT Group and the range from the UK operators For the European telecoms operators Ofcom shows asset betas calculated against both the FTSE All Europe and FTSE All World indices.

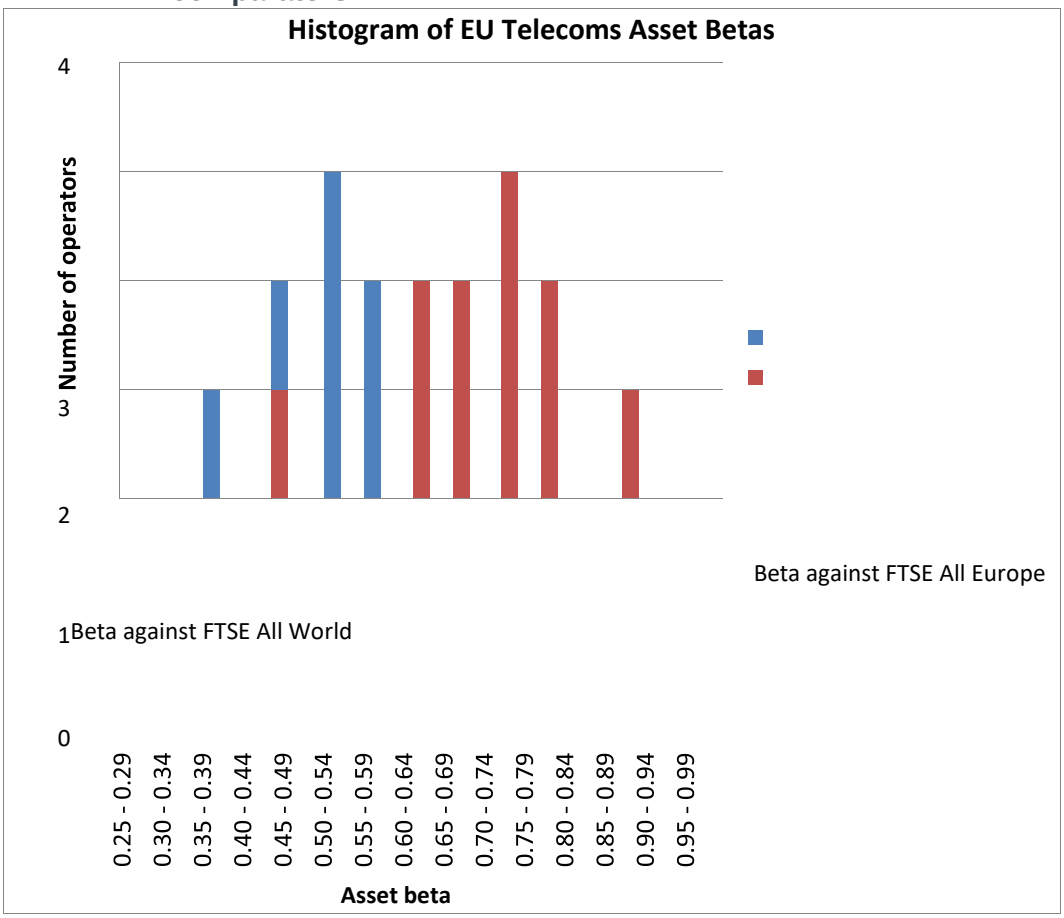
Ofcom compares its range from UK operators with estimates of asset betas for EU operators, choosing to present only the (generally higher) estimates using the FTSE All World. Ofcom's justification for preferring estimates based on the FTSE All World does not appear to be well founded, with Ofcom stating:

> *From Table A16.23 above we observe that the two-year asset betas for BT Group and UK telecoms operators measured against the FTSE All Share and FTSE All World are similar (though the asset beta measured against the FTSE All World currently tends to be a little higher). Given the similarity of these asset betas, we have additionally considered the asset betas for European telecoms operators measured against the FTSE All World.*

The closeness (or not) of asset betas calculated against different indices for a small sample of operators could be simply coincidence and provides little reason to prefer a set of asset betas calculated against one index over another. Generally, Ofcom has used asset betas calculated against the FTSE All World indices to determine **relative** asset betas in particular when considering companies based outside Europe (i.e. whether one class of company has a higher or lower asset beta than another). Ofcom has generally preferred asset betas calculated against home indices to determine the **level** of asset betas, for example when determining the cost of capital for BT Group or UK based comparators.

Including asset betas calculated against the FTSE All Europe index (the 'home' index for these operators), Ofcom's range appears to be relatively high, with all asset betas calculated against the FTSE All Europe index below 0.70 and the majority of the estimates less than 0.55, below the bottom end of the range determined by Ofcom, as shown below.

Figure 7 Distribution of Asset Beta estimates for EU Telecoms comparators



Source: Frontier analysis of data in A16.25

In summary, while the EU Telecoms comparator data presented by Ofcom is broadly consistent with a range from 0.55 to 0.65 derived from the UK operators, it provides little support for extending this range to 0.75 as Ofcom has done.

2.3.3 Ofcom's choice of a point estimate

Despite the fact that there is more support for the bottom half of the range than the top half of the range of asset betas used by Ofcom, Ofcom selected a point estimate at the very top of the range. Ofcom gave three reasons for this choice:

- the fact that BT's asset beta had increased since the BCMR determination;
- the fact that Sky and TalkTalk's asset beta had increased; and
- that using a lower asset beta would have made the implied asset beta for RoBT unreasonably high when reconciling to the overall BT Group Beta.

These three reasons do not appear to justify Ofcom's choice of a point estimate as discussed below.

There is no evidence that any underlying increase in BT's asset beta is driven by regulated services

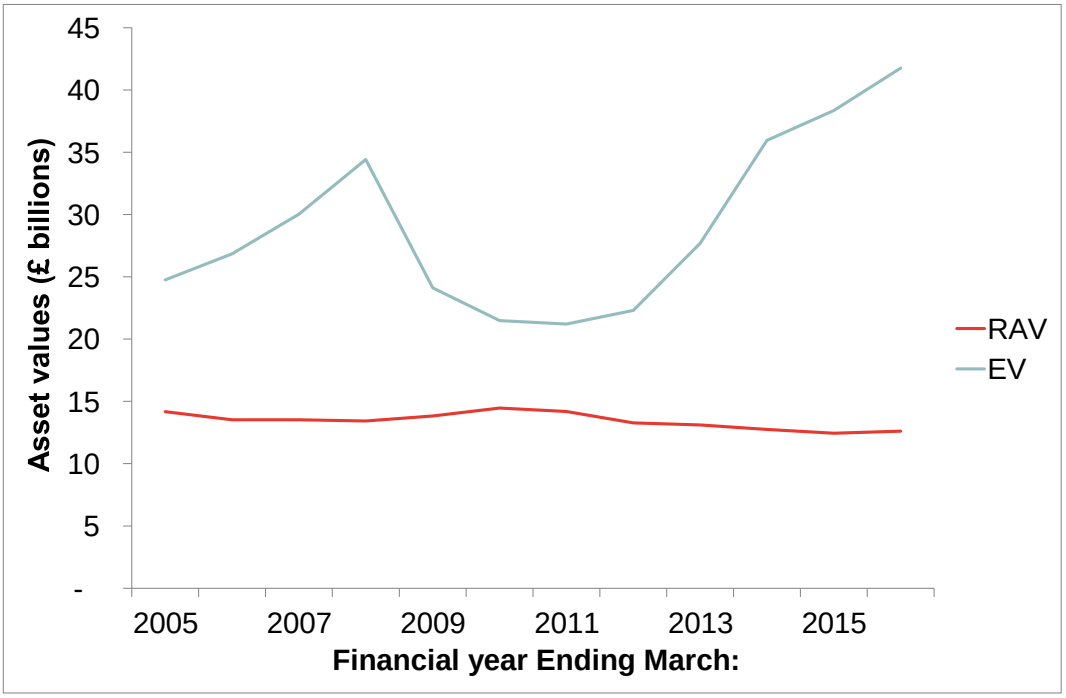
The increase in the estimated asset beta could be due to sampling variation. Even if there was an increase in the underlying asset beta, the low weight of the non-copper regulated services in the overall group means that an equivalent change in the asset beta for these services is neither a necessary nor sufficient condition for this change.

The BT Group operates a heterogeneous range of assets and activities including regulated wholesale services and a wide range of unregulated retail and wholesale services. Over the last decade the scope of BT's unregulated business has significantly increased, making the cost of capital for BT as a whole less useful in ascertaining the appropriate cost of capital for BT's regulated services. For example, BT has invested heavily in sports broadcast rights and acquired the EE mobile network business.

At the same time, the scope of regulated services has decreased; Ofcom has withdrawn price regulation from BT in a number of markets where BT has been determined not to have significant market power (SMP).

The chart below compares BT's enterprise value with the regulatory asset value (RAV) presented in BT's Regulatory Financial Statements since 2005 until 2016 (the latest RFS available)[18].

Figure 8 Comparison of BT Enterprise Value with BT Regulatory Asset Value



Source: BT Regulatory Financial Statements, Bloomberg

Note: RAV is Mean Capital Employed in year, EV is midyear

[18] If the cost of capital is appropriately determined and charge controls are effective at constraining prices to regulated costs, then we would expect investors valuation of regulated assets to reflect the RAV.

The chart shows that regulated assets have been decreasing as a percentage of BT's market enterprise value over time. We can further split the regulated assets into those to which the Openreach Copper WACC is applied and those to with the 'Other UK Telecoms' is applied as shown below for 2016.

Figure 9 Breakdown of BT's Enterprise Value in 2015/16

	Asset value (£ millions)	Percentage
Openreach copper	9,131	21.9%
Other regulated services	3,479	8.3%
Residual	29,142	69.8%
Total EV	41,752	

Source: BT Regulatory Financial Statements and Bloomberg

On a forward-looking basis, following the acquisition of EE[19], the weight of the regulated activities will be further diluted.

There is no evidence that any increase in the overall BT group asset beta in the last year has been driven by the non-copper regulated services. Increases could be driven by structural changes such as the acquisition of EE, or changes in the risk profile of the non-regulated activities, which account for approximately 75% of the enterprise value of BT on a forward looking basis.

While Ofcom presents evidence that there is no apparent systematic relationship between the percentage of mobile assets and telecoms operators' asset beta, this does not demonstrate that the specific asset beta of the EE business was exactly equal to the specific beta of BT's fixed business (indeed it would be unlikely that the two businesses had exactly the same asset beta). As such the acquisition of EE is likely to have led to some change in the asset beta of the BT Group which could explain the increase in BT's asset beta.

Increases in Sky and TalkTalk's asset beta estimates

The argument that the asset beta for Other BT Telecoms should be set at a level of 0.75 because the measured asset betas for Sky and TalkTalk have increased since the BCMR determination appears to have little validity:

- there has been no marked trend in this period beyond the degree of volatility that would generally be expected around beta estimates;

[19] The acquisition of EE was completed in January 2016, i.e. towards the end of BT's 2015/16 financial year. The resulting increase in BT's enterprise value is not shown in the chart above.

- Ofcom has excluded Vodafone from the comparison, and as a result ignored a comparator with a falling asset beta in the period; and
- in any case, the level of the asset betas for all the comparators remain well below the 0.75 level Ofcom is proposing, throughout the period since the BCMR decision.

These points can be seen clearly in the evidence presented by Ofcom.

Figure 10 Ofcom evidence on movements in asset beta for UK telecoms operators

Figure A16.24: Two-year asset betas for UK telecoms operators against the FTSE All Share

Source: Bloomberg, Ofcom analysis. Data as at 31 December 2016.

Source: WLA Market Review Consultation

In addition the activities of UK telecoms operators are largely unregulated and so may over-estimate the asset beta for regulated services. Regulation of network assets can reduce the cost of capital for the relevant assets by reducing the variability of future cash flows in two ways:

- first, by providing greater predictability on prices than in a competitive market through charge controls; and
- second, by reducing the effect of demand uncertainty (and to a degree cost uncertainty) in successive charge controls by resetting prices to take account of unforeseen changes in the volume of services and costs.

The impact of such effects can be seen in estimates of betas between (and within) sectors. Intra-sector comparisons in particular show the potential impact of the reduction in uncertainty on the cost of capital. For example, electricity generation companies under long term supply contracts appear to have a significantly lower cost of capital then those which sell at market prices[20].

As such the data from UK telecoms operators provide no support for increasing the asset beta to a level of 0.75, and would be consistent with an asset beta significantly below this level.

Ofcom's reconciliation to the BT Group asset beta adds little information

Prior to the BCMR decision in 2016, Ofcom decomposed an estimate of the BT Group WACC into two components:

- Openreach Copper; and
- Rest of BT, used to set the WACC for other regulated services.

With only two components, this was a relatively simple de-averaging exercise, with reductions in the WACC for Openreach Copper offset by increases in the WACC applied to other regulated services.

However, in recent years BT's estimated asset beta has been consistently high relative to other telecoms operators. A simple two-way de-averaging of BT's asset beta, with the Openreach Copper element reflecting other network utilities, would lead to the WACC used for other regulated services being significantly above the asset beta for comparator telecoms operators.

In opting for a three way de-composition, with the third component consisting of BT Global services, Ofcom's implicit working hypothesis has been that the high asset beta for BT Group as a whole could be explained by the impact of BT Global Services, which is likely to have an asset beta closer to IT Services companies than telecoms operators. If this hypothesis was demonstrably true, then a reconciliation of cost of capital estimates for the three 'businesses' set out by Ofcom could potentially add value.

However, the continued increase in the BT Group asset beta suggests that BT Global Services alone may not be the sole reason for the asset beta being higher than comparator companies, given the relatively small weight of BT Global Services in the overall group[21]. However, as explained above, there is little reason to believe that an increase in the asset beta for regulated services is the reason for

[20] See for example NERA Changes in Hurdle Rates for Low Carbon Generation Technologies due to the Shift from the UK Renewables Obligation to a Contracts for Difference Regime Department of Energy and Climate Change 9 December 2013, Figure 6.1.
[21] Estimated by Ofcom as 15% of the enterprise value

the increase in the Group asset beta, as implied by Ofcom's proposals. Alternative explanations could include:

- sampling variation in the estimates, with BT's true asset beta being in line with the comparators[22];
- the asset betas for BT's other divisions (i.e. neither Openreach and BT Global Services) being higher than the comparator operators; or
- BT Group's asset beta being distorted by the assets and liabilities of the BT pension fund such that the Group asset beta does not reflect the asset beta's of the underlying operating assets.

While Ofcom classifies the regulated non-copper assets in a broader group of 'UK telecoms' assets, there is no reason to believe that the asset betas of the regulated and non-regulated businesses are exactly equal or even move in line over time. In particular, as explained above, the effect of regulation is likely to be to increase the predictability of prices and hence reduce the asset beta.

[22] For example in 2014, the Brattle Group for Ofcom stated: "*We normally recommend a range of +/- approximately two standard deviations around our mid-point figures: the standard error [for estimates of the equity beta] being 0.11 for the last year of data, and 0.07 for the last two-years.*" Estimate of BT's Equity Beta Mach 2014

Given the low weight of the non-copper regulated services it would be possible for the asset beta for BT Group as a whole to move significantly even if the asset beta for regulated services was stable.

While it is difficult to determine the reason for BT's relatively high asset beta, the range of alternative explanations suggests that the high asset beta for the Group is not in itself a reason to increase the WACC applied to regulated services above a level based on comparator operators.

2.3.4 Conclusion on asset beta for other regulated services

For 'Other UK telecoms', the data on comparators suggests that a range from 0.55 to 0.65 is reasonable, with the UK based operators falling within this range and the data from EU comparators being distributed relatively symmetrically around this range, when appropriately considered relative to their home index.

Ofcom's point estimate, however, is inappropriately high given the evidence presented.

3 REVISED COST OF CAPITAL ESTIMATES

In this section we set out our revised cost of capital estimates for the two sets of regulated services. As noted above, we do not consider that a reconciliation to an estimate of BT Group's overall cost of capital adds significant values and as such we do not present estimates either for BT Group as a whole or for a residual 'rest of BT' category.

Compared to BT's proposals, we make changes reflecting three issues identified above:

- replacing the cost of debt calculated by Ofcom from three components with a direct estimate of the forward looking cost of debt;
- adjusting the ERP and RFR for the cost of equity to reflect a forward looking RFR; and
- using a lower asset beta for the 'other regulated services' category.

Figure 11 Revised estimates of the cost of capital (2020/21)

	Openreach copper access	Other regulated services	Source
Real RFR	-1.5%	-1.5%	Forward rates on gilts
RPI Inflation	3.2%	3.2%	OBR
Nominal RFR	1.7%	1.7%	Calculated
Nominal ERP	7.1%	7.1%	Frontier forward looking estimate
Debt beta	0.10	0.10	Ofcom estimate
Asset beta	0.55	0.65	Frontier estimate based on comparators
Gearing	35%	35%	Ofcom estimate
Equity beta	0.79	0.95	Calculated
Cost of equity	7.3%	8.4%	Calculated
Cost of debt	3.5%	3.5%	Forward yields on BBB bonds
Tax rate	17%	17%	Calculated
WACC (pre-Tax nominal)	6.9%	7.8%	Calculated

Source: Frontier Economics