10 Aldermanbury
London EC2V 7RF
T +44 20 7000 2020

UK telco regulation cannot work to incentivise fibre build as currently designed. The government's new review is a moment to consider radical changes, unlocking both BT's value for shareholders and investment for the UK. This should include a move to water utility-style regulation in up to half of the UK where competitive fibre will never be built. There is potential upside for shareholders and consumers alike.

The Department for Digital, Culture, Media and Sport (DCMS) has launched a six-week call for evidence, ending 30 January, for its 'Future Telecoms Infrastructure Review'.

Unlike Ofcom's Digital Communications review of 2015 to date, which has had to work with the current regulatory framework, this review can go back to first principles and consider whether the framework should be adjusted within EU rules, or an entirely new framework adopted post Brexit.

Our contention is that there are two reasons why UK regulation, as it currently operates, *cannot* work to incentivise fibre build:

1 **Ofcom utilisation assumptions create a pricing umbrella too low for competing operators in most of the country.** To set regulated prices, Ofcom must make a network utilisation assumption. *It sets this at 80% utilisation of an efficient network*. But if Ofcom's sums are right, there is no way a scale third network could ever be built, as, even if it achieved 40% penetration, its charges would need to be *double* Openreach's current ones to make the same return. Thus, competitors can only ever cherry-pick already well-served areas with either high density or high wealth, and cannot roll out in the mass market. It should be no surprise that this is exactly what we have seen over the past 20 years, with virtually no new networks built.

   Ofcom's total exclusion of BT pension deficit costs further contributes to the low umbrella: if Openreach had been a separate company, it would have seen leverage rise nearly 2x over ten years due to the impact of longevity and falling rates on the pension fund, potentially imperilling the company.

2 **No clear allowed returns on incremental capex.** The above would matter less if Openreach were incentivised to invest. But Openreach has very low visibility on how incremental capex will be treated due to the 'Modern Equivalent Asset' (MEA) methodology. Conceptually, MEA could lead to the regulated asset base (RAB) *falling* rather than rising if a fibre network replaced the copper, as fibre networks can be cheaper to build and operate. Sweating existing assets is a logical reaction to this uncertainty.

There is therefore a need to go back to first principles. The following would unlock investment:

- **A utility 'building block' approach to RAB in up to half the country, with allowed returns.** This regulatory method would mean capital projects (e.g. investment in 50% of the UK where there is little likelihood of private investment, including a copper switch-off programme) are added to RAB in an agreed way, replacing MEA and aligning Openreach with other utilities from water to the electric grid. This would unlock Openreach investment and could be targeted at less dense, underserved areas. The impact on the competitive sector would be minimal.

- **Move to regulatory cycles of five years (as in water) or eight years (National Grid)**, not three years as currently. A responsible company cannot invest on the basis of a three-year cycle in a sector where *all* of the investment falls in year one but the return is over a 20-year period. This would be the case even if trust with the regulator were high, which unfortunately is not the case today. Longer cycles should also reduce the cost of capital.

- **Greater use of debt financing, up to 60% of RAB (c£8bn).** Currently BT/Openreach is under-geared versus other utilities, partially because of regulatory uncertainty, and this increases the cost of capital overall. Jeremy Corbyn's Labour Party has raised the valid point that the cost of capital is higher for a privatised company than a nationalised one. Even if the efficiency savings of private ownership outweigh this differential (and it is also possible that gilt yields would rise in reaction to a costly nationalisation programme), there is no reason to run with a higher cost of capital than necessary. A RAB-based regulation with longer review cycles would allow greater leverage. The objection that technology risk makes telecoms different is greatly overstated as all likely technologies, including millimetre wave, require fibre very close to the home (100-200m).

The benefits to shareholders and the UK

There is a valuable prize here both for the UK and for BT shareholders. Indeed, the UK is not alone in this struggle: Italy is also starting to have a similar debate, though EU membership may make changes to Italian regulation more difficult. The benefits of the changes include:

- The UK could unlock BT's large employee and capital resources to deliver progressive *universal* fibre deployment over a 10-20 year period. The incremental cost on bills would be low as it would be offset by a falling cost of capital and be spread across all areas.

- Meanwhile, BT would gain greater investment certainty, a lower cost of capital at Openreach and a more efficient capital structure. Fig 1 shows that leverage is only 2x on the rest of BT if Openreach is levered to 60% of RAB, including the pension deficit. (It is our view that the pension deficit could now reduce over time (see here), so the position could shift to even lower leverage quite quickly.)

Fig 1: Leverage at Openreach at 60% of RAB, FY18e

£m	BT Group	Openreach @60% RAB	Rest of BT
Debt + pensions	17,728	7,800	9,928
EBITDA	7,508	2,461	5,048
Leverage (x)	**2.4**	**3.2**	**2.0**

Source: Redburn

From a fair value perspective, if the Openreach value 'hardens' at 120% of RAB (£15.6bn) and the pension deficit is no worse than £10bn pre-tax, then investors are gaining exposure to the rest of BT at only 9.5x opFCF, an astonishingly low multiple for the premier mobile and fixed franchise in the UK (Fig 2). As mentioned, there is also potential for the pension deficit to reduce, so the multiple may be even lower.

Fig 2: Sum of the parts at current market price

Y/E 31 March (£m)	Adj EBITDA 2018e	Multiple	Value	EV/EBIT 2018e	EV/opFCF 2018e
BT Global Services	448	3.6	1,596	199.9	9.5
BT Business & Public Sector	1,445	7.5	10,866	10.1	9.5
BT Consumer	1,025	7.1	7,329	9.1	9.5
BT Wholesale & Ventures	776	7.0	5,444	11.6	9.5
Openreach	2,461	6.3	**15,600**	14.7	18.9
Other	30		(2,000)		18.2
EE	1,323	4.9	6,476	11.9	9.5
Total value	**7,508**	**6.0**	**45,311**	**11.4**	**11.2**
Specific items ex pension net interest	(600)	2.0	(1,200)		
Total enterprise value			44,111		
Pension deficit after tax			(8,000)		
Net debt FY18e post EE			(9,728)		
Total equity value			26,383		
NOSH – diluted post EE			9,938		
Value per share (p)			**265**		

Source: Redburn

Part of the gain for all sides here is that Openreach's value would decouple from cash flow estimates as investors would pay a higher multiple for greater certainty on long-term returns on a rising asset base.

In the near term, it is likely that BT will announce a capex increase with its Q3 results on 2 February following the conclusion of the Openreach consultation. We would expect at least Sky and BT Consumer to be anchor tenants on this new-build, which press reports suggest will be three million homes passed by 2020 from a plan for two million homes previously. BT would be making this investment under the 'fair bet' principle. It is our contention, however, that BT could do more if the regulatory structure were reformed.

The EU dimension

It is not clear how many of our suggestions are possible within the EU telecom and competition law framework, which is itself evolving.

The framework currently requires three-yearly reviews (though this may move to five years in the draft new framework being negotiated currently).

The framework also prescribes the pricing methodology to be used on wholesale rates, so a 'building block' approach might require special dispensation from the European Commission. The new EU draft legislation proposes regulatory exemption for co-investment plans between ISPs, but does not propose to change the basic regulation of the sector in non-competitive areas. Granting RAB-based regulation to one player even in areas of market failure might require state aid approval.

So, it may be that changes in the UK will have to await the UK's exit from the EU in March 2019 (or 2021 if the transition period is another two years). However, planning new regulation would take most of this time in any case.

Response to the DCMS call for evidence

The DCMS call for evidence poses a number of questions about barriers to long-term investment and lessons from other countries, including moving to regulated asset bases (RAB) or "a diversified model to account for geographic variation".

Our starting point is that while some fibre is being built, we doubt that it will amount to much more than three million lines of a 'third network' by 2025 (Fig 3).

This is only 10% of homes. To this should be added perhaps three million new lines from Virgin Media and then potentially up to five million by Openreach, but this latter figure will depend on whether copper cut-off can be agreed and the wider regulatory issues around pricing and visibility that we discuss. Many of these networks will overlap.

Fig 3: Possible fibre builds by 2022

('000s homes passed)	**2022**
Third networks	
CityFibre	1,200
Hyperoptic	1,500
Gigaclear	350
Total	**3,050**
Existing networks:	
Virgin Media FTTH	3,000
Openreach FTTH	5,000

Source: Redburn

We admit that these are rough approximations based on existing roll-out announcements coupled with some healthy scepticism that targets will be met on time. It is possible that duct and pole access will be transformative for competing builds, but it is too early to form a view on the viability of this regulatory idea.

There are many 'micro' issues to consider, such as how **cumulo rates** (business rates for telecoms) operate and the fact that only five-year relief has been given on fibre. We do not cover these here. Our main focus in this response is the broader question of how economic regulation is operating.

Stepping back, the history of privatised telecoms falls into three broad phases:

1 **RPI-x 1982-2001.** In 1982, Stephen Littlechild designed 'RPI-x' price caps for the soon to be privatised BT. New fibre investment was not the focus, but greater efficiency. Over time, there was limited service liberalisation, starting with the launch of Mercury. This worked well to drive greater service and efficiency at BT.

2 **ULL 2001-2018.** In 2001, the EU designed Unbundled Local Loop regulation. The main purpose was greater service competition for broadband. This also worked well, and today there are three major ISPs on the Openreach network – BT, Sky and TalkTalk – while Virgin provides services on the old cable network, which happily could be repurposed for broadband.

3 **? from 2018.** Today, the new societal need is for better, universal, broadband coverage. It is clear the regulation needs to change to reflect this. The current structure does not lead to fast enough improvements in less dense areas (perhaps 33-50% of the country), where new networks are unlikely to be built.

In designing the third phase, we believe the greatest benefit is likely to come from considering other utility regulatory models such as water. As we have written before ('Why BT Should Volunteer The Split', September 2015) it is also worth considering overseas examples, such as New Zealand's model. New Zealand's approach includes not only FTTH investment, but also some *regionalisation*. This means that the success of the major FTTH provider, Chorus, can be compared to smaller providers elsewhere.

We believe the dissatisfaction with the current regime in the end stems from the fact it insufficiently recognises that broadband is a utility. Competitor builds, however welcome, will always tend to leave some harder to reach houses out in the cold. Society no longer regards this as any more acceptable than not providing universal access to water or electricity. DCMS should follow this logic to its end point and alter regulation for telcos to a utility model at least in the part of the country where there will be no other access network. We are able to structure this for water and electricity, and we should be able to do it for broadband too.

We highlight two aspects of the current regulation that are failing: the low pricing umbrella and the lack of visibility on incremental capex.

(1) The umbrella is too low

Today, Ofcom has two conflicting views. It sees Openreach as a Significant Market Power entity whose returns must be controlled to protect consumers *and* it wishes to see others invest beneath Openreach's 'umbrella'.

There is a fundamental tension here as, under the first consideration, prices are cut as low as possible, while under the second some excess returns must be allowed to Openreach to enable others, who have lower scale, to invest.

Ofcom is trying to have its cake and eat it, but of course cannot manage to do so. Historically, the first priority has won because:

- Ofcom is under political pressure to deliver low consumer prices.

- ISPs like Sky and TalkTalk have concentrated on lobbying for lower MPF (Metallic Path Facility – the UK name for ULL) and Generic Ethernet Access (GEA) prices, as they have been focused on near-term margins rather than infrastructure investment, which is not their core competence.

Consequently, Ofcom's £7.30 per month for unbundled copper and a new, regulated, price of £4.55 for 40Mbps fibre to the cabinet (FTTC) service (the mid-point proposed) by FY21 are primarily designed to avoid consumers having to pay 'above the odds'.

So it should be no surprise that over the last 20 years, the prices set by Ofcom have not left enough margin to promote material investment in new networks.

Getting down to the detail, we see at least two design problems with how Ofcom calculates wholesale prices: (a) the network utilisation assumption and (b) the fact that pension deficit costs are ignored.

(a) The network utilisation assumption is too high

Network economics per line are of course massively dependent on customer penetration of the network. The cost to build can only be recouped over the customers who are actually paying for a service. Ofcom has to make an assumption on utilisation to create its regulated wholesale access prices per line.

If Ofcom makes a low assumption, then Openreach will make excess returns as actual loading is better. But making a very high assumption relative to anything a competing build can achieve guarantees poor economics for most competing builds.

This is a significant problem. Using a 40% assumption instead of the 80% figure chosen would double prices, leaving Openreach with excess profits for many years until new networks were built. Using an 80% assumption makes it hard for networks to be built in most of the country, but keeps prices low for consumers.

Volume forecasts are usually redacted in Annex 10 of the Wholesale Local Access Market Review (WLAMR). However, Ofcom estimates the following broad market trends by FY21:

- Fixed line households will increase from 24.8 million to 26.2 million.
- The average number of Openreach lines per household will fall from 0.87 to 0.80 (i.e. Openreach will effectively enjoy 80-87% utilisation).
- The total number of Openreach lines will fall from 25.1 million to 24.5 million.
- Take-up of broadband on Openreach lines will increase from 79% to 88%.
- The proportion of Openreach broadband lines that are GEA (i.e. FTTC) will increase from 26% to 66%.

Therefore, for a competitor to earn similar returns to Openreach with half its utilisation (40% – which would be extremely good for a new build) it must *either*:

1 Be twice as efficient, or

2 Cherry-pick the best areas, guaranteeing no investment in harder to reach areas.

Moving from 80% utilisation to 50% would mean access prices should rise 60%, all else being equal; moving to 40% would double them.

Note that population growth creates another problem for Openreach. Given its universal service obligation, it has to build these lines in advance of being paid for them, with material capital investment up front. The projected increase in the UK population is material over the next 10-20 years, and it is not clear how these costs are provided for by Ofcom.

(b) Pension deficit costs ignored

An unrelated issue with the pricing umbrella is that Ofcom does not include *either* deficit payments for the pension (as decided in 2010) *or* the rise in pension operating charges of c£100m in FY18 due to 'member experience' (essentially longevity and retirement dates) (see Ofcom's WLAMR document of September 2017).

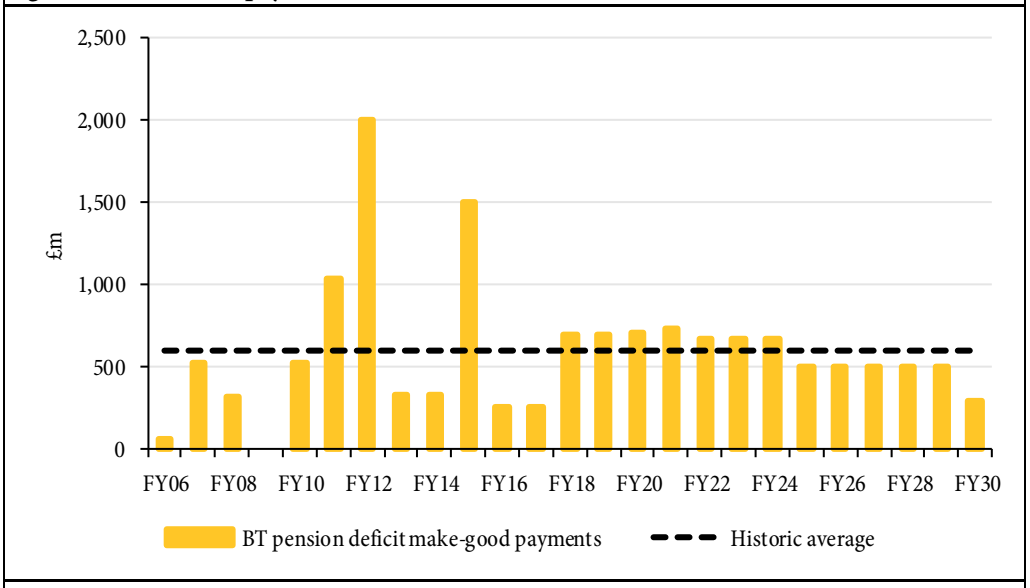
On the deficit, Ofcom claims these pension costs are not 'forward looking'. Yet the deficit has arisen for complex reasons that could not have been reasonably foreseen:

- Longevity increases.
- Impossibility of matching assets to liabilities, including index-linking.
- Fall in real rates to negative levels due to central bank activism.

While c30% of BT employees are in Openreach, we estimate they account for more than 40% of current active scheme members. Thanks to technology change, we also estimate Openreach and its antecedents account for well over 50% of scheme liabilities. The bulk of the pension deficit payments are therefore an Openreach cost.

These costs of £600m pa pre-tax on average (Fig 4) are excluded by Ofcom from its calculations, yet they would lower actual ROCE by around a third.

Fig 4: Pension deficit payments, FY06-30



Source: Redburn, BT

It is true that efficient competitors might not face the kind of ballooning pension costs that BT has faced as longevity increased and rates fell. However the impact on Openreach is likely to reduce the capacity to invest, so this remains a regulatory problem.

Meanwhile, BT's annual pension expense (this time within EBITDA) rose c£100m in FY18.

This was due to 'member experience' and includes longevity changes and expected retirement date changes (the later the less expensive for the pension scheme).

This increase in cost is not being taken into account by Ofcom due to 'insufficient information', according to its most recent WLAMR.

Had Openreach been an independent company, it is likely that over half the current group pension deficit would have landed on it, if fairly apportioned. This would have raised leverage by 1-2x *with no recognition within regulated prices.* In this sense, Ofcom and consumers have received funding from the wider BT group's competitive market activities.

Conclusion

The obvious solution to this conundrum is to move to a utility model (discussed below) in just under half the country, including some pension costs, and adjust the utilisation assumption in the half that is likely to remain competitive for the long term.

(2) Incremental Openreach investment is not rewarded: RAB 'building blocks' required

The debate on regulating 40Mbps GEA services shows the downsides of the current system: Ofcom would like to limit BT's returns, while BT claims it is having its upside capped while it

bore all the downside risk of the investment under free market conditions. Full downside, limited upside is not a rational way to allocate capital.

In a building block approach, this would be avoided. An investment plan to upgrade all consumer lines in certain parts of the country could be agreed. The costs would be spread across all lines.

For sure, this would remove market disciplines on risking capital, choosing technology, executing the build and marketing a service.

However, the benefit is that this approach could be used in less dense areas where competing builds would not be economic.

Ofcom regulates based on a 'Modern Equivalent Asset' concept

A 'Modern Equivalent Asset' (MEA) method is the idea that Ofcom should reward Openreach for running an efficient network, rather than basing regulation on what BT actually runs. By 'Modern', the regulator means the most efficient version of a copper network, not a fibre network.

This contrasts with water, where depreciated cost is used, since replacement value of all reservoirs and sewers would be multiples higher and is not necessary as no one is going to create parallel sewers.

Unfortunately, the costs to build a new fibre and new copper network are similar – in fact, fibre should be cheaper to build and run.

Therefore, there is no incentive for Openreach to move to fibre, as incremental capex to transition to a fibre network could earn no return at all.

While a copper wire may be depreciated over 20 years, this individual wire cannot be swapped to fibre at end of life. There can be no gradual upgrade of the network. Instead, whole areas would need to be transitioned and electronics/optics replaced, potentially before the end of their depreciated lives. We are not clear how Ofcom would treat these costs.

We have simplified in the above, and indeed the regulatory accounts are hard to penetrate for a financial analyst. However, we understand that:

- Ofcom takes base-year data from BT and then adopts a top-down model using gross/net replacement cost, net current assets, operating capability maintenance and depreciation to forecast network component unit capital costs.

- Future costs are forecast using efficiency gains, volume forecasts and asset price changes (even including the cost of copper).

- Any agreement with Ofcom on methodology is liable to change every three years, far less than the 10-20 years required to make a return on large investments (c.f. 40Mbps GEA and the 'fair bet').

Our conclusion is that a *methodological* change will be imperative to unlock investment, particularly in the very large areas of the country where competing networks will never be built. It is beyond our expertise and our role to design a new framework here, but it is clear that some of the necessary elements already exist in the water industry or in overseas examples such as New Zealand.

The cost of capital could be lowered by better regulation

The cost of capital of privatised utilities has become a political issue, as the Labour Party under Jeremy Corbyn has pointed out that the cost of borrowing for private utilities is higher than for government-guaranteed ones, at least in theory.

The subject is a complex one, as the overall argument for privatisation rests on efficiency and market allocation of capital and not on the cost of borrowing alone. It is also possible public borrowing costs might rise if the state attempted to push back into running utilities.

However, in BT's case, it is notable that the level of group leverage is somewhat low relative to water utilities that have leverage of more than 60% of RAB. In addition, as RAB rises with new investment, the level of debt funding could also increase.

5G is less important than fibre and 4G coverage

DCMS also asks questions about 5G investment. We would argue that public money should not be spent on 5G, which is primarily a technology that will be adopted by the global wireless industry to increase capacity in heavily trafficked areas. It is less likely to be used as a coverage technology.

5G's main benefits are not of clearly wide application:

1 **Low latency.** This is useful, but cannot be the main technology for autonomous cars, which will have to work autonomously and not depend on an outside network that could fail or be hacked.

2 **Higher speed.** It is not clear that consumers value higher speeds on wireless networks beyond a certain 'hygiene' level of c2Mbps. Virtual reality will have to be an in-home technology given the headset required, while augmented reality such as Pokémon are not capacity-hungry. Given the ability for consumers to do most data-heavy work at home (software updates, uploads to the cloud), it is not clear they will pay incrementally for faster mobile speeds.

3 **Internet of Things.** Massive machine connectivity is already possible with 4G with a variety of new low-power technologies emerging.

It is therefore more useful to focus public money on excellent 4G coverage (including trains) and on ensuring universal fibre coverage.

Conclusions

The economic regulation of the sector is complex, but is resulting in prices that are too low for scale investment beneath them.

Although Ofcom has rightly attempted to reduce cost to build for competing networks via the duct and pole access initiative, it is too early to tell whether this will result in greater fibre deployment.

The major issues are:

- New builders can never aspire to the 80% utilisation Ofcom uses to set Openreach access prices. While Openreach is regulated on a MEA basis, there can by definition be no scale competitor that would also reach 80% utilisation. Yet a lower assumed utilisation level of 50% would mean access prices would need to rise by 50%, which itself is unpalatable as it would gift Openreach excess profits until competing networks were built.
- This means that the market is only available for 'cherry picking': small-scale builds in particularly high return on capital areas (i.e. dense areas, MDUs and rich villages).
- At the same time, BT has put £7bn gross over 11 years into the pension, with *no* allowance by Ofcom that this is a cost of doing business. An independent Openreach would have seen gearing rise by 1-2x EBITDA for pensions alone, potentially imperilling the company.
- If the RAB is set as a MEA copper asset, ripping this up and replacing it with FTTH could by definition be a money-losing proposition as the RAB theoretically could fall rather than rise.
- Finally, it is unclear how the costs of switching off copper, including dual running, would be recouped, especially in a sector where regulatory reviews occur every three years.

The current system *might* create the conditions for better fibre investment in ten million homes, mainly by BT, but it is more likely that investment will fall well short of announced targets as build costs or take-up disappoint.

Improvements could be made by:

1 Acknowledging which areas of the UK are unlikely to see competing investment at scale and move to a RAB 'building block'-based regulation here.

2 Moving to longer term reviews of 7-8 years, including for competitive areas, once the UK leaves the EU.

Acknowledging some of the real pension costs borne by the company and allowing a higher leverage to be borne by Openreach.

29 January 2018