frontier economics

PRICING WHOLESALE LOCAL ACCESS SERVICES

A report for Vodafone

September 2020

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EXECUTIVE SUMMARY

Ofcom has issued a consultation on its proposed response to Openreach's offer to serve 3.2 million premises in more rural areas. Combined with Ofcom's January proposals for 'Area 2' where it considers that there is a realistic prospect of rival investment in fibre networks, this provides a UK wide set of proposals. Vodafone has engaged Frontier Economics to assess whether these proposals best meet Ofcom's overall objectives.

Ofcom's overall objectives are to incentivise rapid build of and migration to full fibre networks, while protecting customers from BT's ability to exercise market power through setting excessive prices.

Ofcom has split the country into two areas:

- More rural areas (Area 3) where Ofcom considers that the demand can only sustain a single monopoly fibre provider; and.
- More urban areas (Area 2) where Ofcom expects roll out of two or more fibre networks competing between them.

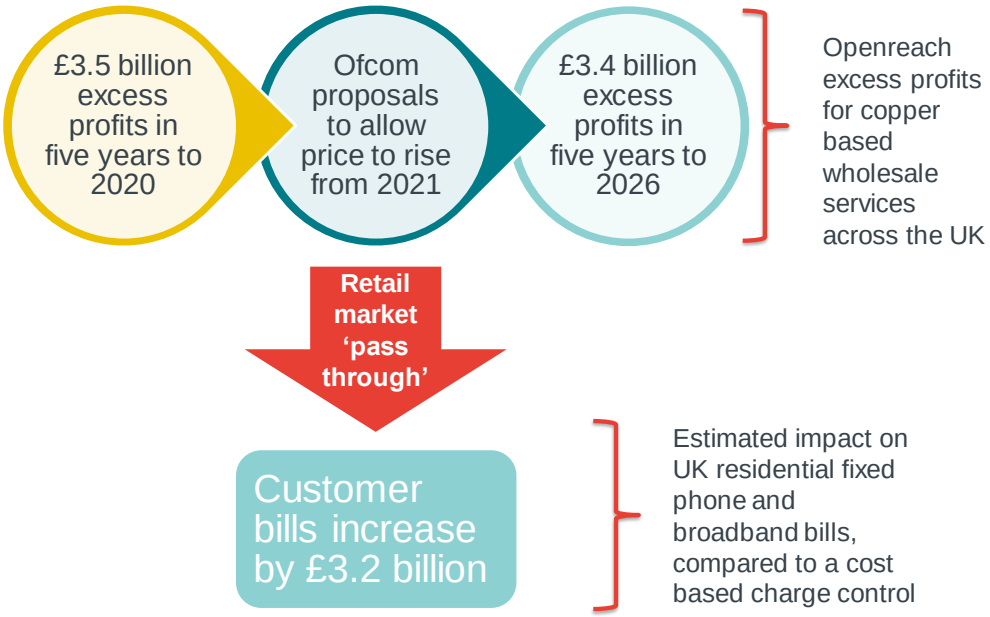
For both urban and rural areas, Ofcom proposes to depart from its regulatory approach to date, where Ofcom has controlled the wholesale prices that Openreach can set so that prices reflect the costs of provision. Instead, Ofcom is proposing to allow Openreach to set copper based broadband prices significantly above its costs on the understanding that this is necessary to achieve its primary objective to deliver significantly higher investment in full fibre (FTTP or FTTH) networks.

Ofcom has previously set out that it would conduct such a detailed impact assessment for all important policy changes.[1] However, as we discuss in our report, Ofcom has **not conducted a robust analysis** of the degree to which its proposals will lead to materially higher fibre roll out or adequately balance the costs of its proposals in terms higher prices for consumers and the benefits of its proposals in terms of increased fibre investment.

This increase in copper based wholesale prices will have the direct effect of (further) increasing Openreach's profits on these services above the level determined by Ofcom to offer investors a reasonable return. The higher wholesale prices paid by retail broadband providers, such as Vodafone, will also be passed on to consumers through higher prices for essential broadband services. This is illustrated below.

[1] https://www.ofcom.org.uk/__data/assets/pdf_file/0029/45596/condoc.pdf

Figure 1 Estimates of excess profits and impact on consumer bills from Ofcom's proposals



Source: Frontier analysis

As we show in this report, this increase in profits on copper based services is not necessary to either:

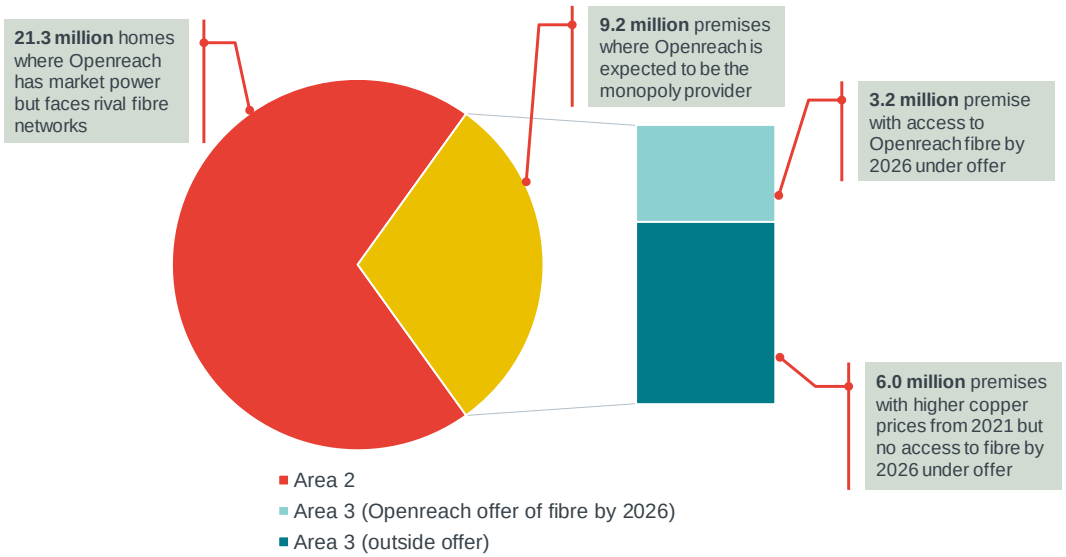
- incentivise fibre roll out by competitors to Openreach, which should largely be reflected in expected price levels set by competition between fibre providers in urban areas rather than the price of copper based products in the period where they are rolling out FTTP networks; nor
- compensate Openreach for its plans to roll out fibre to a minority of premises in more rural areas (called 'Area 3'). This is because the lack of competition in these areas should allow Openreach to make sufficient returns, as in those area, roll out costs are only marginally higher than areas where Ofcom expects a number of competitors to roll out parallel, competing networks.

Ofcom's proposed acceptance of Openreach's conditions for investment in rural areas ('Area 3') to will unnecessarily increase prices

Openreach have stated that, in the more rural UK areas (Area 3), they are planning to roll out to 3.2 million premises in the period to 2026, out of the 9.2 million premises in these areas, as illustrated below.[2]

[2] https://www.ofcom.org.uk/__data/assets/pdf_file/0032/198860/openreach-letter-26-june-2020.pdf

Figure 2 Ofcom definitions of geographic markets and the Openreach offer



Source: Ofcom definition of geographic markets and Openreach offer letter

However, even for this limited roll-out in Area 3, Openreach has applied a number of conditions before it will agree to this roll out, in effect:

- An agreement to allow BT to continue earning excess profits on legacy services by setting the charge control for these services across the whole of Area 3 to increase in line with inflation rather than prices for these services reflecting cost; and
- Allowing freedom to set full fibre (FTTP) prices in Area 3 for at least 10 years after investment unconstrained by regulation, despite having a monopoly position in this area.

As we discuss in this report, these conditions are not necessary for Openreach to make an adequate return on the proposed fibre investments, but will simply allow Openreach to extract additional profits at the expense of rural customers, most of whom will not benefit from Openreach's offer to roll out which covers less than 35% of premises in Area 3.

Indeed, Ofcom's own definition of Area 3 implies that it includes many locations where *a monopoly* network can *profitably* roll-out a network: the distinction between Area 2 and 3 is about whether competition can be supported rather than whether *any* roll-out is profitable.[3] .

Thus, in large parts of Area 3, Openreach as a monopoly provider should be able to generate sufficient revenues from rolling out a future-proof full fibre network to justify the investment. This is reinforced by empirical evidence which shows rival operators, such as Virgin Media and Gigaclear, are rolling out in areas with similar costs, showing that they believe they can make a reasonable return even when competing with BT as an incumbent and hence sharing the market.

[3] While some locations within Area 3 will be unprofitable, even for a monopoly provider, the Government has committed £5 billion for roll-out in the most expensive to cover parts of Area 3 supported through government subsidy.

Ofcom appears to have accepted Openreach's assertion that it needs excess profits from existing copper customers to subsidise its full fibre build costs roll out to 3.2 million premises, without a thorough review of whether this is supported by the evidence. Not only is such a policy unjustified to achieve this coverage, on the basis of the available evidence, but it would also incentivise Openreach to demand *even higher* prices to fund its next tranche of full fibre roll out.

Ofcom's assessment of the benefits of its proposals in urban areas ('Area 2') is flawed

Ofcom's assessment of policy options for Area 2 assumes that there is a simple trade-off between the level of prices paid by consumers for legacy copper-based services in the next five years and the level of investment in fibre networks in this period.

In urban areas the relationship between prices paid for copper-based services in the next five years and the expected returns on rivals' investments is weak for a number of reasons:

- The investments made by rivals will need to be recovered predominantly by fibre subscribers from 2026 onwards, when prices should be determined by competition between fibre networks rather than by regulation of copper services which will be progressively withdrawn; and
- Even during the period of co-existence of copper and full fibre networks the link between prices for FTTP networks rolled out by new entrants and the regulated price of much lower speed legacy broadband services will be limited – as consumers place increasingly high value on ultrafast broadband services.

Ofcom attempts to support a simple relationship between copper prices and fibre investment through a review of the timing of its policy statements and investment decisions and roll-out announcements. However, there appears to be no clear causal relationship between announced changes in policy and actual investment.

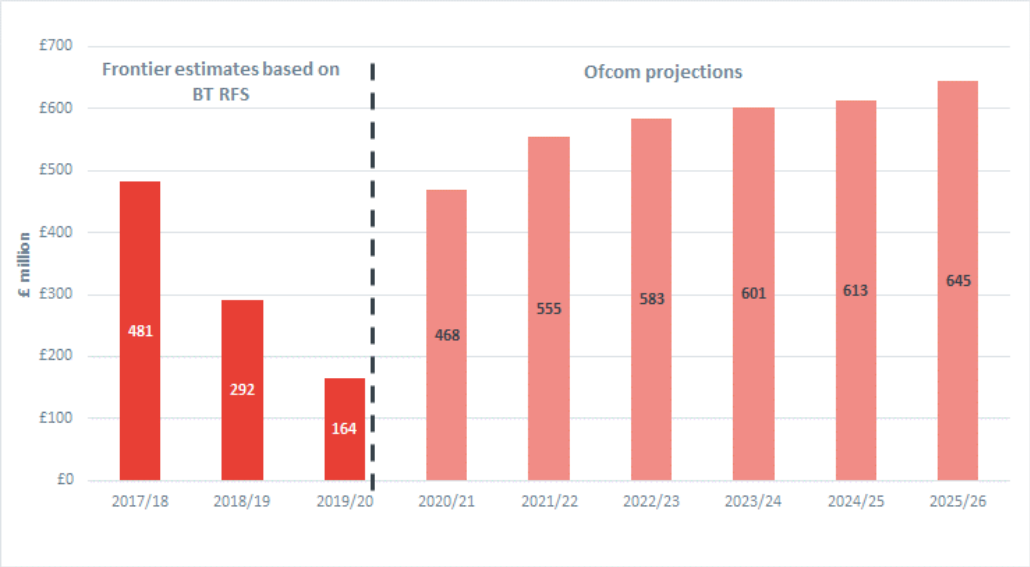
Ofcom's proposals result in outcomes that are at odds with its stated objectives to protect consumers and ensure a "fair deal"

As can be seen in the chart below, Ofcom's proposals, including accepting Openreach's offer in rural areas, would lead to Openreach making excess profits of the order of c. **£3.4 billion** over the next five years on copper-based services. This is similar to the **£3.5 billion** of excess profits earned on copper-based services in regulated markets[4] in the five years to March 2020.

The chart also highlights the impact of the significant change in Ofcom's regulatory approach as it has gone from reducing excess profits over time through charge controls to deliberately allow Openreach to set prices increasingly above cost.

[4] WLA, WFAEL and WBA market A

Figure 3 Openreach's excess returns in copper services following Ofcom's proposals



Source: For 2017/18-2019/20 – Frontier estimates based on BT RFS; from 2020/21 onwards, Frontier estimates based on Ofcom's projections in Access Review CPI-X Model or Cost modelling for active services.

The pass through of higher wholesale prices to residential customers would lead to consumers paying around **£3.2 billion**[5] more for their services than if Ofcom implemented a cost-based charge control over that period.

This £3.2 billion additional cost to consumers is unjustified:

- In Area 2, Ofcom's own modelling shows that a tighter charge control is consistent with a level of fibre prices which allow a new entrant sufficient returns to justify roll out. Setting charges at more than is necessary simply results in consumers paying more for no corresponding benefit.
- In Area 3, Openreach has only offered a non-binding[6] "voluntary commitment" to roll-out fibre to 3.2 million premises. However, the investment required to roll out fibre to these premises could be recovered from the future profits generated by subscribers to fibre services, given Openreach will not face competition in these areas. Openreach's offer also leaves 6 million premises without fibre in these areas, despite subscribers in these areas paying higher prices under BT's and Ofcom's proposals to subsidise Openreach's roll out. Unlike consumers in Area 2, these customers would not even benefit from any positive spill-over effects of increased competition for fibre based services, as Openreach will continue to be the monopoly provider.

Thus, in both Area 2 and Area 3, consumers will pay more than necessary for Ofcom to meet its long term objectives, in terms of fibre roll out. The potential harm to consumers from these price increases is highlighted by the COVID-19 crisis,

[5] Differences between estimates of the cost to consumers and the estimates of excess profits at a wholesale level reflect, amongst other, differences in the assumption of 'pass through' of wholesale costs to consumers and the degree to which a cots based charge control would reflect the costs projected by Ofcom.

[6] Ofcom, July 2020, WFTMR 2021-26: Proposed approach to pricing WLA services in Geographic Area 3, para 3.16.

which has shown the significant value to 'universal' access to affordable FTTC based' broadband.

How Ofcom can protect the interests of consumers while meeting fibre roll out objectives

A well-evidenced and robust impact assessment, weighing up the different policy options to choose the option that best meets Ofcom's objectives of incentivising fibre roll out while minimising the cost to consumers is highly necessary for Ofcom to make an informed decision.

For Area 2, this requires considering options which result in lower prices, including a cost-based approach, which could achieve the same objective in terms of incentivising rival investment.

For Area 3, as Openreach does not face any prospect of serious competition, a barrier to investment is that Openreach will assess any incremental profits from investing in FTTP against the profits it could make by continuing to offer copper based broadband services. It would therefore not be expected to have an incentive to roll out FTTP when it can generate high profits on its legacy network. Ofcom seems to have ignored this fundamental trade-off, leading to Ofcom proposing to accept an offer which would perpetuate Openreach's high profits.

There are however other policy options, consistent with regulatory best practice of incentivising investment of monopoly network service providers, that could not only incentivise fibre roll out, likely leading to a faster roll out of full fibre than under the Openreach offer, but also protect customers from excessive pricing. Incentivising monopoly network operators to upgrade their networks is a problem that has been addressed by other UK regulators such as Ofgem and Ofwat. Ofcom's approach could be adjusted to reflect this experience, and this would involve:

- Setting outcome targets for full fibre roll out, with incentive mechanisms to ensure these targets are met;
- Requiring Openreach to produce a detailed and well-justified business plan to meet these targets, in line with best practice experience of regulating quality/network upgrade investments of monopoly network service providers, such as water companies and energy companies[7]; and
- Implementing a best-practice RAB approach, which should (by definition) provide investors with a reasonable return, while protecting customers from excessive pricing.

A well designed RAB based approach would achieve Ofcom's objective of ensuring BT has appropriate incentives to roll-out full fibre to at least 3.2 m premises in Area 3, at a lower cost for consumers. This approach, by removing the excess profits available in a 'do nothing' scenario would also remove the barrier to future fibre roll out after 2026.

[7] Ofcom's proposals seem to be based on a an acceptance of a (two-page) letter from Openreach, see https://www.ofcom.org.uk/__data/assets/pdf_file/0032/198860/openreach-letter-26-june-2020.pdf

1 INTRODUCTION

1.1 Background

1.1.1 Vodafone has asked Frontier to assess Ofcom's WFTMR proposals

Vodafone has asked Frontier to conduct an economic assessment of Ofcom's proposals for regulating wholesale inputs, as set out in its Wholesale Fixed Telecoms Market Review (WFTMR) consultation documents[8], with a focus on inputs to superfast broadband services.

Key proposals in the document include:

- Ofcom has introduced a distinction between the approach to regulation in potentially competitive areas (covering c.70% of UK households) ("Area 2") and non-competitive areas (covering the remaining c.30%) ("Area 3").
- In Area 2, Ofcom proposes to move away from a cost-based approach for regulating the wholesale price of Openreach's 40/10 Mbit/s FTTC service (FTTC 40/10) to an inflation-indexed price cap ('CPI-0') from March 2021. Ofcom claims that this 'price continuity'[9] approach will incentivise investment in full fibre networks. A key implication of this approach is that prices for FTTC 40/10 would be higher under Ofcom's proposals than if they were set under a continuation of the current cost-based approach.
- In Area 3, Ofcom is proposing to align its approach to FTTC regulation with its proposals for Area 2, which is a condition of Openreach offer to rollout fibre to 3.2 million premises in these areas.[10]

1.1.2 Summary of our previous report

The analysis presented here builds on a previous report[11] that Frontier submitted in response to Ofcom's initial proposals for regulating superfast wholesale local access services, as set out in its March 2019 consultation – *Promoting competition and investment in fibre networks: Initial proposals – Approach to remedies*.

As the WFTMR consultation document is broadly consistent with Ofcom's initial proposals, our previous findings are also relevant here. We found that an impact assessment that clearly set out and compared the expected costs and benefits of the new approach was necessary because Ofcom's proposals marked a significant change in regulatory trajectory, with the intention to have a material effect on the market.

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8 Ofcom January 2020, WFTMR Consultation, Volume 4: Pricing Remedies; Ofcom July 2020, WFTMR Consultation, Pricing wholesale local access services in Geographic Area 3 with a BT Commitment to deploy a fibre network.

9 Ofcom 2020 WFTMR Consultation Volume 4: Pricing Remedies, paras 1.14 – 1.39

10 Ofcom July 2020, WFTMR Consultation, Pricing wholesale local access services in Geographic Area 3 with a BT Commitment to deploy a fibre network.

11 Ofcom's proposed remedies for 2021 to 2026, A Report for Vodafone, 25 July 2019. Available at https://www.ofcom.org.uk/__data/assets/pdf_file/0014/160610/vodafone-proposed-remedies-2021-26-annex.pdf

We considered that an impact assessment was particularly necessary in the current context, as it was not clear that the costs of the new approach outweighed the benefits:

- The investment incentive mechanisms implicit in Ofcom's proposals required an increase in retail prices to deliver increased investment by increasing expected revenues – this meant that the expected costs to consumers from the proposals of **increased prices appeared relatively certain**.
- By contrast, the **impact on investment,** increasing which is the express intention of Ofcom's new approach, **was not certain**. We considered that the proposals were unlikely to increase expected revenues sufficiently to incentivise significantly more investment than would take place in the counterfactual.
- As a result, the benefits to consumers (to offset the certain costs from higher prices) appeared to be neither substantial nor certain.

In rural areas, Ofcom's proposals to allow an increase in prices for customers in areas where fibre was not expected to be rolled out to partially subsidise fibre roll out in other rural areas appeared neither fully justified nor a sustainable strategy for achieving complete roll out.

Ofcom's new approach also applied to the Business Connectivity Market, where the need for a change was unclear – if the objective of the new approach is to increase investment in fibre networks, this has already been met in the BCM as the majority of the market is served using fibre.

Ofcom's latest consultations provide more detail on its approach, but it does not appear that the above issues have been adequately addressed. We discuss this below.

1.1.3 Focus and structure of this report

In this report we consider the more detailed assessment and rationale for Ofcom's proposed approach set out in the WFTMR consultation documents, focussing on new information that was not available when we conducted our previous report. .

To this end, our report considers:

- the need for a robust impact assessment, identifying areas where Ofcom's assessment *does not* cover aspects that should be covered in a proper impact assessment (Section 2);
- the flaws in the assessment of benefits Ofcom *has* carried out for its proposals in Area 3 (Section 3);
- the effective absence of an impact assessment for its proposals in Area 2, which covers 70% of UK households (Section 4); and
- the costs to consumers as a result of these proposals, especially in the context of the COVID-19 crisis (Section 5).

2 THE FRAMEWORK FOR ASSESSING OFCOM'S PROPOSALS

2.1 The need for an impact assessment

Section 7 of the Communications Act 2003 imposes a duty on Ofcom to carry out impact assessments where its decisions would be likely to have a significant effect on businesses or the general public.

Ofcom has set out its approach to conducting impact assessments, in *Better Policy Making. Ofcom's approach to Impact Assessment* [12] which sets out the need for an assessment of the costs and benefits of policy proposals[13] although noting that this may not be determinative and while all costs and benefits must be identified, in some cases it may not be possible or proportionate to quantify.[14]

When considering both the need to carry out impact assessments and the comprehensiveness of these assessments, Ofcom notes that they will be guided by the principle of proportionality:

> *"we expect Impact Assessments to be carried out in relation to the great majority of our policy decisions […] a decision which is likely to have a wide-ranging impact and/or impose substantial costs on stakeholders will have a more comprehensive Impact Assessment than a decision which will have a less significant impact."*[15]

The proposals to move away from a cost-based charge control are a significant policy decision as they are expected to affect the prices paid for (superfast) broadband by the majority of UK households. They would therefore be expected to fall within the 'great majority' of those decisions for which Ofcom would publish an impact assessment. In addition, as explained below, we estimate that the proposals will impose significant costs on consumers, strengthening the case for a comprehensive impact assessment.

2.2 Ofcom's analysis for Area 3 falls short of a proper impact assessment

For Area 3, Ofcom's objective is to set appropriate incentives for BT to invest in fibre networks, while protecting consumers from excessive pricing (including through a weakening of retail competition). In its January 2020 consultation, Ofcom considered two options for how to regulate WLA services in Area 3:

- Maintaining Ofcom's current approach to regulation, which relies on regulating the existing copper-based services and requiring the costs of fibre investments to be recovered solely from the sale of fibre products; or

12 Ibid.

13 Ibid paragraph 5.30

14 Ibid paragraph 5.

15 Better Policy Making. Ofcom's approach to Impact Assessment Issued: 21 July 2005

- A RAB approach, in which the costs of fibre investments are recovered from all products (and all consumers in Area 3), including the existing copper-based services.

Ofcom did not provide a quantification of these options. Ofcom stated that it had a preference for a RAB-approach as this would help to ensure that consumers are protected from excessively high prices whilst providing Openreach with incentives to invest in fibre.

Ofcom stated that if Openreach were to provide a fibre roll-out commitment then:

> *"Noting that BT/Openreach has suggested CPI indexed prices, in setting the level of any forecast RAB control, we would need to carry out a value-for-money assessment of the scale of fibre rollout against the amount of additional revenue being provided."*[16]

Put another way, in its January 2020 consultation, Ofcom had not concluded that it would allow a CPI-0 charge control if Openreach did make a fibre roll-out commitment. Instead, it said that it would need to conduct a "value-for-money assessment" on Openreach's fibre roll-out commitment.

On 26 June 2020, Openreach sent Ofcom a 2-page letter committing to roll-out fibre to 3.2m premises in Area 3 by 2025/26 (without public subsidy).[17] However, it said that this commitment was based on a number of requirements about the upcoming charge control, set out below.

OPENREACH'S REQUIREMENTS[18]

"From April 2021 the framework will:

(i) allow the prices for existing copper and FTTC anchor services to increase with CPI indexation each year;

(ii) establish a new FTTP anchor at 40Mb/s only at a premium to the FTTC anchor;

(iii) allow pricing flexibility at higher bandwidths; and

(iv) Adjust access supply remedies to support copper retirement – e.g. allowing us to adopt stop-sell policies where FTTP has been deployed to a certain threshold.

We note that for the above items this would result in the same regulatory approach for Areas 2 and 3."

Openreach stated that it had also made a number of assumptions about the regulatory framework after 2026, effectively requiring no price regulation of fibre (and where copper switch off has occurred, no regulation at all) for at least a decade and ideally 15 years.[19]

16 Ofcom, January 2020, 2020 WFTMR Volume 4: Pricing remedies, para. 2.35.

17 https://www.ofcom.org.uk/__data/assets/pdf_file/0032/198860/openreach-letter-26-june-2020.pdf

18 Ibid.

19 *"However, our investment case needs to look well beyond the 5 years of this review and we therefore need to make assumptions about the shape of the regulatory framework after 2026. In this regard, we assume:*

(i) In intervening to regulate any access charges after 2026, Ofcom will honour the fair bet on all our FTTP investments across both Area 2 and Area 3 – i.e. it will provide us with a fair opportunity to earn and keep

In its July 2020 consultation, Ofcom is proposing to simply accepted Openreach's proposed approach to the regulatory framework for the next charge control period, as summarised by the impact of Ofcom's July 2020 proposals relative to its January 2020 consultation document.

Figure 6 Change in Ofcom's proposed price controls[20]

Product	January 2020 Consultation proposal	New proposal
MPF	CPI-CPI	CPI-0%
FTTC 40/10 rental	No specific control – part of FTTC rentals basket	CPI-0%
FTTC rentals basket	CPI-5.75% to CPI-15.0%	No FTTC rentals basket (no cost-based control for bandwidths other than 40/10)
MPF mark up	Prices marked up by a K-factor	No K-factor mark up

It is unclear whether Ofcom has implicitly accepted the other conditions regarding the Openreach's freedom to set fibre prices post 2026 and there appears to be no assessment of the impact of these proposals.

In its July 2020 consultation Ofcom estimated that the wholesale over-recovery in Area 3 would amount to £313 million in NPV terms over the five-year charge control period.[21] However, for the reasons detailed in Section 5.3, we consider this is an understatement of the over-recovery as Ofcom has over-estimated the level of prices that would be set under a cost based charge control scenario.

We consider Ofcom's assessment of 'value for money' of Openreach's proposals for the next market review period in Section 3.3. In summary, we find that the assessment has flaws, both conceptually and in terms of the assumptions used to populate the calculations.

Factors that should be considered in a proper impact assessment

In addition to correcting for the above flaws, the following factors need to be considered as part of a proper impact assessment;

- **Consider the overall net welfare impact of the proposals compared to alternatives**. The critical question is whether any positive impact from Openreach's commitment to roll-out fibre to 3.2m premises (out of 9.2m premise in Area 3) could be achieved without the significant adverse impact from copper customers having to pay higher prices to subsidise the roll out.

  To demonstrate that allowing a CPI-0 charge control combined with pricing flexibility for higher bandwidth services represents value for money, Ofcom would need to show that (once it has a more detailed set of commitments from

upside returns commensurate with the considerable risk associated with this long term, scale investment including those stemming from demand uncertainty and execution (e.g. risks around build and provisioning cost in rural areas); prices would only be reduced to forward-looking estimates of costs once Ofcom is satisfied that fair bet returns can be earned over the life of the investments being made in this period. We further assume that that Ofcom will set charge controls, if and when required, in a way that enables us to recover (efficient) costs. (ii) clarity over the long-term regulatory approach, noting Ofcom's expectation that this approach would exist for at least two charge control periods and that our parent, BT, has said it expects to last for at least 15 years". Ibid.

20 Post-copper retirement Ofcom proposes to switch its charge control from MPF and GEA FTTC rentals to GEA FTTP 40/10.

21 Ofcom, July 2020, WFTMR 2021-26: Proposed approach to pricing WLA services in Geographic Area 3, para 3.25

Openreach and Ofcom has set its own output targets) a CPI-0 charge control is strictly necessary for Openreach to be able to make a sufficient profit on rolling-out fibre to 3.2m premises i.e. Ofcom could not put in place a framework giving Openreach sufficient incentive to meet this roll-out commitment under a tighter charge control. Ofcom has failed to carry out such an assessment in its July 2020 consultation, despite having stated in its January 2020 consultation that it would assess the value for money of any commitments provided by Openreach in exchange for a laxer charge control.

- **Assess the distributional consequences of its proposals.** Ofcom's proposals will have a number of important distributional impacts, which it has not considered. Given Ofcom's proposed 'RAB approach', customers of copper-based services will be cross-subsidising full fibre customers in Area 3. The consequences of this could be amplified given that COVID-19 has made 'universal' access to robust broadband even more important. As full fibre will only be rolled-out to 3.2m out of 9.2m premises in Area 3, most copper customers will be contributing towards fibre services from 2021 even though they will not have the option to upgrade to fibre services by 2026. In addition, many of these customers in areas not covered by fibre services may have poor quality copper-based services, given that they may be further away from the street cabinet than average.
- **Evaluate how its proposals will impact Openreach's incentives to roll-out full fibre to additional premises in Area 3 in the longer term**. Even if Openreach does roll-out fibre to 3.2m premises (out of 9.2m premises) in Area 3, this will still leave the majority of households without access to fibre in Area 3. Ofcom should consider the impact of its proposals on Openreach's incentive to roll-out fibre to additional premises in future given that:
  - Ofcom's proposals will increase the profits from copper-based services in Area 3, which will make it less attractive for Openreach to roll-out full fibre to additional premises in Area 3 (beyond the 3.2m commitment). This is because, as a result of Ofcom's proposals, Openreach would be cannibalising excess copper profits by rolling-out fibre.
  - Ofcom's proposals in its July 2020 consultation are potentially rewarding Openreach through higher profitability for withholding investment. This may provide Openreach with an incentive to withhold fibre investment in future unless Ofcom offers Openreach the continued opportunity to earn excessive profits.

2.3 Ofcom's analysis for Area 2 falls significantly short of a proper impact assessment

Whilst Ofcom has examined qualitatively, the relative merits of a sub-set of potential approaches to regulation, the analysis presented in the WFTMR Consultations falls far short of a proper impact assessment consistent with its own guidelines.

Ofcom presents a shortlist of options for setting charge controls in Area 2:[22]

[22] Ofcom 2020, WFTMR Consultation, Volume 4: Pricing remedies, para. 1.12

1. **Pricing continuity**, projecting the current price cap on FTTC 40/10 at a constant level in real terms (i.e. CPI-0), whilst allowing pricing flexibility on higher bandwidths;
2. **Cost-based,** setting prices to reflect costs;
3. **'Adaptive regulation',** setting i) price caps in line with cost before altnet entry in an area and ii) a price floor (at the level of a new entrant's costs) following entry; and
4. **A 'copper wedge'**, introducing a gap between the price charged to access seekers for services delivered over the copper network and the price received by Openreach

Ofcom's assessment considers how each of the above would perform against its objective of *"supporting investment in fibre networks through promoting network competition, while protecting consumers from excessive pricing or a loss of retail competition in the short term."*[23]

It finds that pricing continuity is its preferred approach on the basis that:

- It considers that, whilst cost-based controls and adaptive regulation would provide more protection to consumers in the short-run they *"would be unlikely to promote network competition, which would deliver benefits to consumers in the longer term."* [24]
- Whilst the 'copper wedge' approach would provide '*some support for network competition*'[25], Ofcom considered that there were legal issues with it and that it would be disproportionate.

Separately (in an Annex), Ofcom estimated Openreach's over-recovery on copper-based access products under the pricing continuity scenario, relative to a cost-based approach (where the prices of all copper-based access products are set in line with costs). It found that this would amount to around £650 million in total in Area 2 and over the five-year charge control period.[26] However, for the reasons detailed in Section 5.3, we consider this is an understatement of the over-recovery as Ofcom has over-estimated the level of prices that would be set under a cost based charge control.

Ofcom has not attempted to estimate the impact on consumers. While the relationship between regulated wholesale prices and competitive retail broadband prices is complex, our indicative modelling indicates that the true cost to consumers of CPI-0, due to higher retail prices relative to a cost-based charge control, could be in the region of £3.2 billion across the UK, equivalent to £120 per broadband subscriber. This increase in retail prices leads in turn to wider welfare impacts associated with Ofcom's proposals that have not been considered.

Despite acknowledging that there are costs associated with its chosen approach, Ofcom has not attempted to assess, formally, whether the net impact of pricing continuity is positive relative to the full range of alternative options. Crucially, Ofcom has not demonstrated that pricing continuity will causally deliver dynamic benefits (in the form of increased network competition) that will outweigh the higher

[23] Ofcom 2020, WFTMR Consultation, Volume 4: Pricing remedies, para. 1.11

[24] Ofcom 2020, WFTMR Consultation, Volume 4: Pricing remedies, para. 1.74

[25] Ibid, para. 1.75

[26] Ofcom 2020, WFTMR Consultation, Annex 16, Table A16.7

costs to consumers. Rather, it simply asserts that "*we consider the long-term benefits of increased network competition supported by our proposals will outweigh any higher prices paid by consumers in the short term.*"[27]

Ofcom also appears to dismiss the need for a formal CBA, arguing that

> *"Even a simple illustrative calculation suggests it is likely that consumers will benefit. For example, if over this review period prices were £1.50 higher per line per month, and 5 million premises are passed by new rival networks, the long-term benefits would need to be less than £1.50 per month per home passed for the benefits to outweigh the costs.*[28]

However, this is simply an illustrative example with unrealistic numbers which cannot adequately replace a robust CBA which would require:

- establishing that there is a causal relationship between its proposed approach to the WLA charge control and increased network competition, which it considers to be its main benefit - in other words, that Ofcom's preferred approach would objectively deliver materially greater investment/ network competition than a tighter charge control (for example 5 million premises passed by rivals that would not be passed under a CPI-CPI or a cost-based control);
- In line with its own guidelines on conducting impact assessments, the impact assessment needs to identify and consider *all* relevant costs and benefits[29] and seek to quantify these where feasible/ proportionate; and
- Distributional impacts should also be considered as large net benefits which accrue to one group of customers at the expense of net costs to other groups of customers may not be acceptable even if overall there are positive net benefits.

[27] Ofcom 2020, WFTMR Consultation, Volume 4: Pricing remedies, para. 1.93

[28] WFTMR Vol 4 1.93

[29] For example, if the benefits assumed are due to increased competition from rival, then the costs of achieving these benefits in terms of increased investment and operating costs by these rivals should be taken into account as it is reasonable to expect these to be passed through to consumers in the long run.

3 OFCOM'S APPROACH TO AREA 3 IS FLAWED

As will be discussed in this section in more detail, Area 3 has been identified by Ofcom as locations where only one network can roll-out fibre, which means that Openreach is likely to continue to be the monopoly provider in the future.

Given this expected monopoly outcome, it is particularly important to ensure that regulation is well-designed, as competition will neither act as a constraint on pricing nor encourage investment or innovation.

Furthermore, BT has a track-record of extracting excess profits in markets where it has significant market power (SMP), even when they are regulated – we estimate this to amount to **c. £12.3 billion** across all SMP markets since 2006.[30] These excess profits have been particularly concentrated in those more rural geographic areas where BT faces more limited competition, defined as the Wholesale Broadband Access Market A. In the latest financial year BT had a share of the downstream market of over 99% and generated a return on capital employed of 153% at the wholesale level. The risks of excessive pricing and poor quality of service to consumers in Area 3 are particularly high , especially as these constitute parts of the country that have historically been less well-served by high speed connectivity.

Instead, as we explain in this section, we find that Ofcom's proposals, which in essence simply accept Openreach's pre-conditions for fibre roll-out in Area 3 during the next price control period, fall well short of this. Crucially, Ofcom has not critically assessed whether these conditions are necessary for Openreach to make a reasonable return on these fibre investments. As a result, under Openreach's proposals (CPI-0 for MPF/FTTC 40/10 and pricing flexibility for higher bandwidths), which Ofcom adopts in its July 2020 consultation, most consumers in Area 3 would be facing higher prices up to 2026, without any corresponding benefit in terms of fibre roll out.

Openreach's assumption that fibre prices would not be regulated in future charge controls, were it to be accepted, paves the way for more excess profits for BT in the coming years at the cost of consumer welfare.

3.1 Ofcom has not conducted a robust assessment of its proposals

It is clear that Openreach's conditions, if accepted in full, will mean consumers will be paying higher prices for copper-based services in the short-term in this market review period and high prices for full fibre in the medium-term, due to Openreach's requirement for no fibre regulation relative to a cost-based charge control.

Ofcom has failed to assess the impact of these proposals robustly as it does not have sufficient details of the proposals nor set out clearly defined alternative policy options:

[30] See Annex A for more detail.

- **Openreach has not provided Ofcom with enough details for it to conduct a proper impact assessment**. In its January 2020 consultation document, Ofcom had stated that:

  > *"In order for us to have confidence in a forecast approach, we would need to satisfy ourselves that either Openreach's commitments are robust or we have a way of enforcing any commitment that Openreach makes."* [31]

  However, if Ofcom's proposals are based on this 2-page letter from Openreach,[32] which is focussed on Openreach's expectations for the future regulatory framework, then this provides no details of Openreach's proposed roll-out commitments. Therefore, Ofcom does not seem to be in a position, based on the available evidence, to assess whether *"Openreach's commitments are robust"* based on the letter.

  Furthermore, even if more information on the business plan underlying BT's proposals has been made available to Ofcom by BT, Ofcom should also consider the determination of appropriate output targets for Openreach, and set out what it believes to be the appropriate terms and conditions for these targets to be achieved. .

  Openreach should be required to produce a much more detailed business plan before Ofcom decides on the most appropriate form of charge control.
- **The commitments are not legally binding**. Ofcom has itself acknowledged that Openreach's commitments are not legally binding[33]. Therefore, as things stand, Ofcom cannot even guarantee that Openreach's roll-out commitments will be met by the end of the market review period, despite higher prices being set from the very beginning of the period.
- **Ofcom has not set out a robust and forward-looking regulatory framework**. Ofcom has not considered the option of a robust RAB framework, which is in line with the approach used by other regulated sectors in the UK (see Section 3.4). Instead, it has used elements of a RAB based approach in an inconsistent manner to attempt to demonstrate the need for increased profits on copper-based services to offset a supposed 'fibre shortfall' (see Section 3.3). Ofcom has then considered two variants of the mechanism for customers of copper-based services across Area 3 to subsidise Openreach's fibre build for a minority of customers within Area 3. Again, this makes it difficult to carry out a proper impact assessment as Ofcom has not effectively specified the full range of policy options that it should be evaluating. It also provides no clarity on the impact of Openreach's offer in future market review periods.
- The ability of Openreach to cross-subsidise fibre roll out with excess profits from customers of copper-based services may also distort potential competitive entry by alternative fibre providers who do not have access to this additional source of funding.

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31 2020 WFTMR Volume 4: Pricing remedies, para 2.29

32 https://www.ofcom.org.uk/__data/assets/pdf_file/0032/198860/openreach-letter-26-june-2020.pdf

33 *"While the BT Commitment to deploy fibre in Area 3 is a voluntary commitment (and is therefore not binding), we are confident that BT has the resources and incentives to meet that commitment."* July 2020 consultation document

3.2 Ofcom has not adequately determined why Openreach is unwilling to roll out fibre in Area 3.

Openreach has indicated that it is unwilling to roll out fibre under the current regulatory arrangements of a cost-based charge control on copper. Ofcom has interpreted this as being due to Openreach being unable to profitably roll out in Area 3, i.e. that there is a 'fibre shortfall', without critically assessing whether such a fibre shortfall exists.

Indeed, as mentioned above, evidence from performance in the last five years indicates that in situations where BT has SMP, it is able to extract profits well in excess of those allowed by Ofcom – just in the last five years, BT has earned over **£3.5 billion in excess profit** in Fixed Access Markets and WBA Market A. If Ofcom were to impose a CPI-0 charge control for MPF/FTTC 40/10 services for the next 5 years, then this would result in **an additional £3.4 billion** in excess profit in the WLA market alone. This is set out in Annex A.

This implies that BT's proposals, by increasing BT's ability to make excess returns in the absence of fibre investment, strengthen the *dis-incentive* to fibre roll out in Area 3. .

The remainder of this section discusses why Ofcom has erred in its assessment of a fibre-shortfall.

3.2.1 There is no fibre shortfall for commercial roll out in Area 3

As mentioned above, Ofcom assumes there is a 'fibre shortfall', i.e. that the revenues attributable to Openreach rolling out fibre in the lowest costs parts of Area 3 is not sufficient to justify the investment required. Ofcom then assumes that Openreach investors need to be compensated for any fibre investments by increasing prices for all customers taking copper-based services in Area 3 to cover this shortfall. However, this assumption is inconsistent with the definition of Area 3.

Area 3 is defined as all areas where there is unlikely to be material rival investment, while Area 2 is defined as areas which can support two or more fibre networks.[34]

Area 3 can then be further broken down into:

- Premises where fibre network costs are low enough that Openreach as a monopoly provider of fibre can make a return sufficient to invest in fibre, i.e. commercial roll out is feasible; and
- Those very high cost areas where even as a monopolist, Openreach could not make a return sufficient to invest in fibre as there is not sufficient willingness to pay by the consumers in that area. Ofcom has excluded these areas from its analysis as this roll-out will be subsidised.

Given the cost curve is relatively flat at the boundary between Area 2 and Area 3, there are geographic areas classified as Area 3, where the cost of roll out is only marginally greater than the cost of roll out in the highest cost parts of Area 2. For

[34] Ofcom, January 2020, 2020 WFTMR Volume 1: Overview, summary and introduction, para 2.26

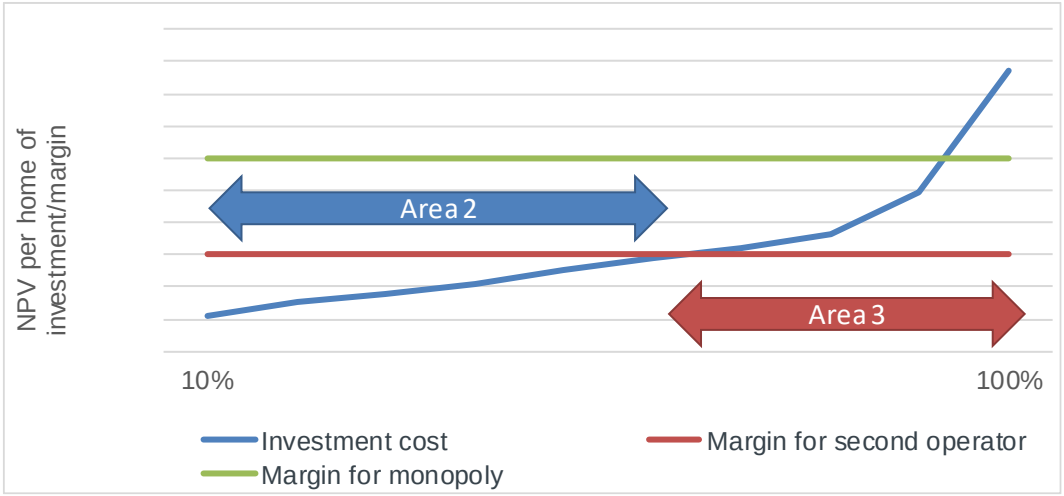
example, Virgin Media continues to roll out in (by definition) Area 2, reporting a cost per premises past (CPP) of £620 in 2019 and achieving penetration over 30% after 4 years.[35] This compares to Ofcom's estimate of a CPP of between £370 and £490 and a connection cost of £280 for the 3.2 million premises Openreach has offered to roll out to[36], with an uptake of 90% after 8 years.[37]

This demonstrates that costs in the lowest cost parts of Area 3 are similar to the highest cost parts of Area 2. However, the margin that Openreach, as a monopoly operator, should be able to earn from investments should be at least twice that of a second operator competing against Openreach in Area 2:

- Having market power should enable Openreach to set higher prices in Area 3 than a rival competing against Openreach in Area 2; and
- Openreach will have complete control over the subscriber base in Area 3, allowing controlled migration from copper-based services to full fibre and meaning that it does not need to spend on customer marketing or stranded assets such as final drops due to customer churn.

If a second operator can profitably roll out in the highest cost parts of Area 2, with prices set to a degree by competition and an expectation of having at best half the market, then it must be possible for a single operator to roll out profitably in the lowest costs parts of Area 3 as illustrated below.[38]

Figure 4 Illustrative example lack of fibre shortfall in Area 3



Source: *Frontier*
Note: *Illustrative*

Given that Openreach will clearly target the lowest cost parts of Area 3 in any non-subsidised roll out there will not be a fibre shortfall for the 3.2 million premises Openreach has offered to roll out to. In these lower cost areas the gap between

https://www.libertyglobal.com/wp-content/uploads/2020/02/Liberty-Global-Q4-2019-Investor-Call-Presentation.pdf

[36] The CPP figures may not be completely comparable between Virgin Media and Ofcom's assessment due to differences in the infrastructure deployed when 'passing' a home.

[37] Ofcom fibre shortfall model

[38] While in theory the fibre shortfall could be due to the boundary between Area 2 and Area 3 being set incorrectly, empirical evidence of the recent build of BT's rivals such as Virgin Media and Gigaclear in areas where are likely to be near the border between Areas 2 and 3, suggest that this is not the case. If this were the case then Ofcom would need to readjust its approach across both Area 2 and Area 3.

the investment it requires (the blue line in the chart above) and the monopoly margin (the green line in the chart above) means that absent regulation, Openreach will be able to generate significant profits, protected by barriers to entry.[39]

Where the cost curve is above the margin that even a monopoly provider can generate then there must be some compensation mechanism to cover this shortfall, either by letting a regulated operator increase prices for other users to the extent necessary to cover this shortfall or through direct subsidy. However, Openreach would have no incentive to include such areas in the 3.2 million premises that it plans to pass given the expectation that there will be a direct subsidy for these premises, which it would forego by covering these areas under the proposed agreement.

3.2.2 There are alternative explanations for Openreach's unwillingness to roll out in Area 3

Ofcom appears convinced that absent increased profits from copper customers in Area 3, Openreach would be unwilling to materially roll out in Area 3, even though based on the above analysis there can be no fibre shortfall for commercial rollout (where there is a shortfall, there will be government subsidies).[40]

There are a number of plausible reasons why Openreach may choose not to roll-out in the absence of additional copper revenues:

- Openreach rolling out a full fibre network would mean foregoing excess profits that it is currently enjoying (see Annex A) and expects to earn in the future by delivering copper-based services, requiring incremental excess profits to incentivise roll out; As long as a positive incremental profit from rolling out fibre in these areas is lower than the profit it foregoes on the copper-based service, BT (unlike an altnet) will have no incentive to upgrade; or
- Openreach may consider that it could extract additional profits by withholding investment, even though this investment would earn a reasonable return (or may even occur in the absence of regulatory intervention). For example, in 2009, Openreach said that it planned to roll-out full fibre to 10% of UK households by 2012[41]. However, Openreach instead rolled out FTTC. In contrast, a number of incumbents across Europe, such as Telefonica[42], now have good full fibre coverage including in more rural areas.

If Openreach's unwillingness to roll out is due to some combination of these reasons, an increase in copper-based service prices in return for a non-binding

[39] In contrast in the lower cost parts of Area 2, the threat of entry by third operators may constrain the returns that can be earned by a 2nd operator.

[40] We explain below that Ofcom's estimates of a fibre shortfall are due to errors in calculation.

[41] In particular, Openreach said that it would roll-out fibre to 40% of UK households by 2012 of which 25% would be full fibre. "Proposed Variation to and Exemption from BT's Undertakings under the Enterprise Act 2002 related to Fibre-to-the-Premises and Fibre Integrated Reception System – paragraph 1.2" (Ofcom 9 October 2009).

[42] Telefonica Spain has already covered 23.7m premises with full fibre (https://www.telefonica.com/documents/162467/145816197/rdos20t2-eng.pdf/094fd2dc-e414-b1d6-d2c4-41358c496d78). Telefonica Spain is also targeting 100% full fibre coverage by 2025 (https://www.telefonica.com/en/web/press-office/-/telefonica-will-achieve-100-fibre-coverage-in-spain-by-2025-and-lead-the-implementation-of-5g)

ambition of rolling out full fibre 3.2 million premises would not be the appropriate regulatory response as this would:

- increase excess profits earned on the copper network by the premises not passed, thus further dis-incentivising fibre-roll out for those premises in future periods. Conversely Ofcom could incentivise fibre roll out by reducing returns on the existing legacy assets; or
- reinforce the incentive for BT to consider withholding investment by rewarding BT with continued excess profits from such a strategy without a robust mechanism to claw them back.

There is evidence of BT being able to use this strategy successfully in the past. For example BT has received the vast majority of the subsidies under the £1.8 billion BDUK superfast programme.[43] However a large part of the subsidy paid to BT was 'clawed back' as the original business plans used to justify investment were unduly pessimistic. Of the subsidies received by BT, under £0.5 billion appears to have been used to subsidise broadband specific equipment[44], £0.5 billion has been set aside for future expenditure under the clawback expenditure[45] which until spent can be used to fund BT other activities. The remaining subsidy appears to have been allocated to expenditure on infrastructure such as poles and duct, reducing the investment required to maintain this infrastructure.

3.2.3 Ofcom's approach does not reflect existing regulatory practice for incentivising investment in monopoly markets

Ofcom has recognised that its assumptions about Area 3 means that a RAB based approach is appropriate and this could include a degree of pooling of costs across customers, for example for distributional reasons. A robust RAB framework, as developed by other UK regulators, can address issues of incentivising efficient investment in line with policy objectives, while protecting customers from excessive prices.

However, Ofcom has not considered a robust RAB framework for Area 3 which could be consistently applied in future market reviews but instead has taken elements of a potential RAB approach and applied them in a disjointed fashion:

- Pooling copper and fibre revenues so as to cross subsidise fibre roll-out from increased prices for copper customers to reflect the notional fibre shortfall[46]; and
- Assessing the 'value for money' of Openreach's model by a flawed high-level analysis of a 'fibre shortfall' and the cross subsidy from copper customers to Openreach required to make up this hypothetical shortfall.

[43] https://www.nao.org.uk/wp-content/uploads/2015/01/The-Superfast-Rural-Broadband-Programme-update.pdf

[44] Based on the FTTP/FTTC Fibre Rollout Funding components report in BT's Regulatory Financial Statements.

[45] BT 2020 Annual Report page 159

[46] The ability to flexibly recover costs between customer groups and over time to a degree is a potential benefit of a RAB approach which could provide a more appropriate price structure for consumers. However, under Ofcom's proposals copper customers will transfer value to fibre customers and to BT shareholders without any corresponding benefit.

In the rest of this section we will:

- explain why Ofcom's calculation that there is a fibre shortfall for the 3.2 million premises is flawed and hence Ofcom's assessment of the need to increase copper prices by CPI-0 to cross subsidise Openreach's investment is not supported; and
- set out how a traditional RAB approach could be used to incentivise investment.

3.3 Ofcom's modelling of a fibre shortfall is flawed

3.3.1 Ofcom's approach of estimating fibre cash flows incremental to a hypothetical copper business case is unreliable in the long term

Both the fibre shortfall and value for money elements of Ofcom's quantitative analysis in Area 3 are based on estimating the Net Present Value (NPV) of incremental cash flows for fibre and for a CPI-0 charge control compared to a counterfactual. The implicit counterfactual in both cases is of a hypothetical ongoing copper-only network regulated based on cost-based charge controls reflecting nationally averaged costs.

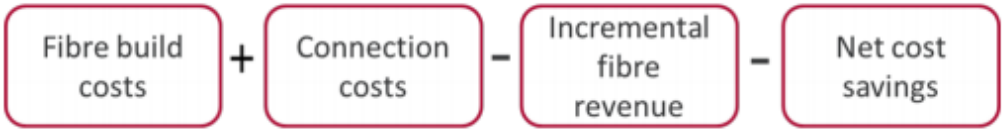
In RAB terms, this counterfactual implies that Ofcom considers the appropriate opening value of the RAB for Area 3 is equal to the Net Present Value of the future revenues under this counterfactual less the NPV of the future expenditure (both opex and capex) required to maintain the hypothetical ongoing copper network.

This means that the fibre shortfall can in theory be calculated by determining the NPV of future cash flows incremental to this counterfactual, as the recovery of the initial RAB value is funded from the hypothetical copper only cash flows.

Ofcom's incremental approach is illustrated by Ofcom in its calculation of the fibre shortfall:

Figure 5 Ofcom illustration of its incremental approach

Figure A2.1: Methodology for calculating the fibre shortfall



Source: July Consultation

While an incremental approach is conceptually reasonable, in practice this is not a reliable approach for regulatory policy assessment:

- accurately determining incremental cash flows is challenging even where there is an existing copper network but will be increasingly challenging as the copper network is run down and retired following copper switch off;
- however, an NPV calculation for determining a fibre shortfall or determining 'value for money' needs to reflect incremental cash flows into perpetuity. Similarly if Ofcom in the future needs to set prices under a RAB approach or

attempt to determine whether a 'fair bet' condition[47] has been met, Ofcom would need to compare actual cash flows against the hypothetical counterfactual in the future.

For example in an attempt to assess incremental cash flows over at 20 years, in order to assess 'value for money', Ofcom has made assumptions about a 'fibre premium' over hypothetical copper-based prices, despite at the same time assuming copper switch-off in 2031. The notion of a copper premium after copper switch off is clearly meaningless because once copper has been switched off, it will no longer constrain fibre prices, and there will be no copper-based services against which to measure a "premium". Following copper switch-off, fibre prices should be set reflecting fibre cost, either through competition or regulation. In the long run Ofcom should be regulating prices to reflect the cost base of the fibre network[48], as all copper assets will have been retired and even BT accepts that regulation will be in place at this point.

In practical terms, continued reliance on a notional fibre premium compared to a hypothetical copper-only network will lead to increasing errors over time as the copper network becomes an increasingly artificial construct.

Thus, using a "fibre premium" as the approach to estimate fibre cash-flows is impractical and inconsistent with an assumption of a rapid copper switch-off.

3.3.2 Ofcom's population of its fibre shortfall model understates the returns from fibre investment

Ofcom attempts to model the parameters set out in Figure 5 above:

- Fibre build and connection costs;[49]
- Incremental fibre revenues; and
- Net cost savings.

However, there are a number of material flaws with Ofcom's modelling of the fibre shortfall.

Ofcom has truncated the analysis at 20 years

In theory, NPV calculations should be carried out into perpetuity. Ofcom has carried out its modelling over a 20 year period with no terminal value to reflect cash flows in later years, despite the fact that many fibre assets will have a useful economic lifetime that is significantly higher than 20 years. This is confirmed by the model, which includes investment forecasts drawn from Ofcom's bottom-up model showing minimal additional investment up to 2057/58 (when the forecast ends).

Ofcom has previously stated that a 40 year time horizon (plus a terminal value) is appropriate for modelling fibre networks:

[47] Referred to in the Openreach letter

[48] Under a RAB approach the value of some copper assets that have not been fully recovered may be implicitly recovered in capital charges post copper switch off to prevent the value of these assets being stranded.

[49] We have not carried out an assessment of the fibre build and connection costs.

> *"In regard to the duration of the assessment, we have sought to base the model on the long run relationships between service volumes and component volumes (and associated costs). We consider that a 40 year horizon is sufficient to capture long run relationships, given the asset lives involved. Costs beyond the 40 year horizon are captured using a perpetuity calculation. We note that we have modelled a 40 year duration in other recent Ofcom bottom up cost models, including the 2013 and 2017 NCC models; and 2015 and 2018 MCT models. Using a long assessment duration also gives us the option to use economic depreciation should we wish to calculate service unit costs under that depreciation approach.*
>
> *Given the difficulty in constructing robust forecasts over long periods, we propose to take an approach (as we have in other models) of assuming a steady state forecast after a certain point. We therefore propose to explicitly model (for example for volumes and costs) out to 2056/57, which is 40 years from the start of the assessment in 2017/18."*[50]

By taking no account of incremental margins earned after a twenty year time period, either through explicit forecasts or a terminal value Ofcom will significantly underestimate returns on fibre investments.

Ofcom's assumptions on incremental fibre revenues are too low

Ofcom's assumption is that there will be no change in overall demand with full fibre roll out but incremental revenues will be solely due to higher prices: a fibre premium.

Ofcom's modelling assumes that there will be a limited fibre premium:

> *"The bottom of the range is based on our proposed 'fibre premium' for the 40/10 FTTP anchor product and assumes that £1.50-£1.85 per month of additional revenue is earned for the full 20 years.*
>
> *The upper end of the range assumes that Openreach can set a price premium for higher bandwidth fibre services (for speeds above 40/10 FTTP). This is at a maximum of £4 per month for the first 10 years. After which, for years 10 to 20, the premium reverts to £1.50-£1.85 per month."*[51]

Importantly, once the copper network has been switched off, then Openreach can raise the price of fibre to the level required to recover its costs, so the premium can be as high as it needs to be to justify the investment, subject to customers willingness to pay. Indeed Openreach wishes to have pricing freedom in order to fully exploit this.

However, even prior to the retirement of the copper network, where copper-based services may place a partial constraint on fibre prices, Ofcom is likely to have understated the fibre premium. Ofcom's assumed fibre premium appears to be based on its analysis of current pricing in the market which suggests that there is

[50] Promoting competition and investment in fibre networks - Initial consultation on the approach to modelling the costs of a fibre network (Ofcom 21 June 2019), para 5.12

[51] WFTMR 2021-26: Proposed approach to pricing WLA services in Geographic Area 3, para. A 2.16

not a large differential between ultrafast vs FTTC comparing offers across different platforms. However, this analysis is misleading (see Section 4.4.3).

If the FTTP premium were not material, then this would imply that even on a forward-looking basis, the incremental value to consumers delivered by FTTP compared to FTTC is modest. This would be inconsistent the rationale of a strategy of incentivising investment in ultrafast services.

Ofcom has expressed the view that the additional value from FTTP services relative to FTTC is comprised of:

> *"• The additional benefits to end-users from having a broadband service with higher and more stable speeds (relative to broadband provided over copper with the same stated headline speed).*
>
> *• The additional benefits to end-users from a broadband service that is more reliable service (i.e. subject to lower faults) relative to broadband provided over copper.*
>
> *• The additional benefits to access seekers purchasing a fibre broadband services as a result of cost-savings through delivering a more reliable service to customers; and lower exchange-based costs."*[52]

The benefit of more reliable speeds may be greater in rural areas may be greater than on average for the UK as a whole. Ofcom has stated that:

> *"Consumers that purchase an FTTC service with a headline download speed of 40Mbit/s may in practice receive slower speeds than this. This is due to the degradation of the speed of the service as a result of relying on the copper network between the cabinet and the premises (**with the level of degradation increasing as the distance between the cabinet and the premises increases**). By contrast, consumers on FTTP are likely to receive the headline speed (or very close to the headline speed) of the service they purchase."*[53]

Given that the performance gap between FTTP and FTTC depends on the distance between the cabinet and the premises, it is also likely that the fibre premium will be higher in rural areas (i.e. in Area 3). This is because the distance between the cabinet and the premises will often be higher in rural areas. For example, there are over 600k premises (about 12% of premises) in BDUK superfast intervention areas (likely to be within Area 3) that cannot get 24Mbps download despite having access to FTTC[54].

The extent to which consumers (and therefore access seekers) will value higher speeds will depend on the range of use cases available. It is widely recognised that the number of use cases for FTTP will increase over time. As a result, it also seems reasonable to assume that the FTTP premium could increase over time, whereas Ofcom has assumed the opposite under its central and low scenarios i.e. the FTTP premium will fall to a level that only reflects the greater reliability of fibre in delivering current bandwidths. Ofcom's forecasts are also fixed in nominal terms,

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52 Promoting investment and competition in fibre networks: Wholesale Fixed Telecoms Market Review 2021-26 ParagraphA22.3

53 Promoting investment and competition in fibre networks: Wholesale Fixed Telecoms Market Review 2021-26 - Annexes 1-23 (Ofcom - 8 January 2020), para. A22.4

54 https://www.whatdotheyknow.com/request/649584/response/1582238/attach/3/FOI2020%2004118.pdf?cookie_passthrough=1

i.e. with no allowance for inflation even though the cumulative effect of inflation over 20 years is almost 50%. This implies that the premium is falling in real terms over time.

Ofcom underestimates avoidable expenditure in the long run, following copper switch off

Ofcom takes into account some cost savings from Openreach switching off its copper network in future:

> *"We anticipate that Openreach could benefit from operating cost savings over the life of the fibre investment from being able to retire its copper network. These savings mainly relate to lower maintenance costs as the number of faults on the FTTP network will be significantly lower than on the copper network. We have also included the likely cost savings relating to the closure of copper local exchanges, such as accommodation and power."*[55]

Ofcom estimates the net[56] avoidable cost savings as £2.6 per line per year. This compares to an MPF rental fully allocated cost of £84.10 per year and an FTTC 40/10 rental cost of £47.37 per year in 2019/20[57], i.e. Ofcom estimates only around 2% of the total cost of delivering copper-based services is avoidable if the copper network is decommissioned.

While the derivation of the avoidable cost has not been made public by Ofcom, the very low level of the estimate compared to the FAC suggests that this is only an estimate of the avoidable costs in the short run and does not take account of most of the wider avoidable costs in the long run from switching off the copper network in an area such as:

- the costs of maintenance of the copper cable network, rather than reactive fault repair;
- the costs operating and maintaining FTTC equipment such as VDSL DSLAMs and their cabinets; and
- operations and maintenance of a range of active equipment in exchanges such as DSLAMs, MSANs and test equipment;

In the long run the costs avoided will be both the operating expenditure of these assets but also the need for ongoing replacement capital expenditure, which can be proxied by the CCA-OCM depreciation charge for these assets.[58] The table below presents estimates of the combined operating expenditure and OCM depreciation charge for these assets.[59]

[55] Promoting investment and competition in fibre networks: Wholesale Fixed Telecoms Market Review 2021-26 - Annexes 1-23 (Ofcom - 8 January 2020), para. A18.38

[56] Ofcom also have included some offsetting cost opex increases. Ofcom has also include for reasons which are not entirely clear, an assumption about substitution of Ethernet services by FTTP services in the estimate of avoidable costs.

[57] Based on the 2019/20 BT RFS

[58] This is the approach used by Ofcom in its modelling of future expenditure when setting charge controls

[59] Based on the costing of relevant components in BT's regulatory financial statement

Figure 6 Estimate of annual long run annual expenditure on copper specific assets (£ millions / £ per line)

	HCA operating cost	Supplementary depreciation	Total opex and OCM depreciation	Per copper line
Copper network	1,219.0	132.6	1,351.6	54.44
Active exchange equipment	214.2	2.3	216.5	8.76
FTTC equipment	383.7	1.2	384.9	15.50
Total	1,816.9	136.1	1,953.0	78.7

Source: BT 2019/20 RFS

While there will be some offsetting expenditure on the fibre network, this expenditure is likely to be significantly lower in the immediate post-copper switch off for two reasons:

- In the medium term, with the full fibre networks being relatively recently installed, there should be limited need for replacement capex of fibre cables; and
- In the longer term, full fibre networks should require lower ongoing opex and capex than Openreach's current FTTC network due to an all-passive access network with fewer active components and because fibre cables are less prone to degradation due to issues such as water ingress than copper cables.

This suggests that the Ofcom estimate of avoidable costs is a significant under-estimate of the avoidable costs for Openreach following copper switch off.

A further issue is that Ofcom assumes that the net cost savings do not start until 2030/31. However, some of the net cost savings should start materialising as subscribers start switching from copper-based services to full fibre services, which according to Ofcom will happen from 2021/22 onwards. For example, the reduction in repair costs associated with lower fault rates on fibre networks should start materialising as soon as subscribers start switching from copper to fibre services.

3.3.3 Ofcom's modelling of the value for money of a CPI-0 charge control underestimates the profits compared to a 'do nothing' counterfactual

Even if there were a fibre shortfall of the magnitude estimated by Ofcom, Ofcom's modelling of the necessity to allow prices to increase at CPI-0 to compensate Openreach contains numerous errors.

In particular as set out in Section 5.2 the incremental revenues generated by setting a CPI-0 price caps are significantly underestimated, as Ofcom has over-estimated the prices under a cost-based charge control, in the absence of fibre roll out (e.g. the counterfactual).

There also appear to be a number of inconsistencies between the assumptions in the fibre shortfall modelling and those in the CPI-0 modelling which means that the comparison between increased revenues and the 'fibre shortfall' is not on a like-for-like basis. For example, in its fibre shortfall model[60], Ofcom has assumed that all of the build costs occur in the first year of the charge control (2020/21)[61]. However, in Ofcom's discounted cashflow model, it has assumed that Openreach's roll-out of fibre to the 3.2m premises is evenly distributed across the charge control period.[62] This means that any fibre shortfall should be discounted when compared to incremental revenues calculated on NPV terms as at 2019/20.[63]

Ofcom's approach also implies that Openreach would not roll-out any fibre in Area 3 absent Openreach's commitment and the associated relaxation of Ofcom's charge control. However, as explained below, there are a number of reasons why this may not be the case. As a result, Ofcom may have over-estimated the additional fibre roll out due to Openreach's offer.

In its July 2020 consultation, Ofcom stated that:

> *"While the BT Commitment to deploy fibre in Area 3 is a voluntary commitment (and is therefore not binding), we are confident that BT has the resources and incentives to meet that commitment. In May 2020, BT announced an ambition to deploy a fibre network to 20m premises by the mid to late 2020s.* ***The BT Commitment to commercially deploy to 3.2m premises sits within that broader ambition****."*[64]
> *[Emphasis added]*

Given the above, it is unclear that Ofcom's proposed light-touch price regulation in Area 3 has resulted in Openreach committing to **incremental** fibre roll-out of 3.2 million premises. In particular, as recognised by Ofcom, the 3.2m commitment is not additional to the 20m premises that BT had already planned to roll-out to. At best, Openreach may just have shifted exactly where it plans to roll-out fibre to ensure that it could offer a commitment to Ofcom in Area 3.

In the letter, Openreach also does not provide any commitments about when in the next charge control it will roll-out fibre to 3.2m premises. Absent regulation, it may roll-out most of the fibre lines towards the end of the charge control.

There are also additional reasons why Openreach's proposals may not result in an extra 3.2m fibre connections in Area 3:

- Openreach is required to re-invest £0.5bn of funds from BDUK due to the "gain share" mechanism;
- There is likely to be some roll out in Area 3 due to a combination of Openreach rolling out in contiguous areas or exchange areas which will require rolling out in Area 3 to 'join up' Area 2 roll out; and

[60] https://www.ofcom.org.uk/consultations-and-statements/category-2/bt-commitment-area-3-fibre-network

[61] See sheet "RAB calc - 200k tranches"

[62] See sheet " Cost recovery calculation"

[63] In reality BT may have an incentive to roll out first in Area 2 where it faces competition before meeting regulatory commitments which would mean the 'losses' would be further discounted.

[64] WFTMR 2021-26: Proposed approach to pricing WLA services in Geographic Area 3, para. 3.16

- Ofcom appears to be expecting *some* roll-out of fibre services in Area 3 by alternative operators[65]. Openreach may decide to respond to the roll-out of fibre by these operators by rolling-out its own fibre. In addition, Openreach may have decided to roll-out fibre to some premises in Area 3 to prevent entry by other operators, if there is only room for one player.

3.3.4 Conclusion on Ofcom's modelling

As discussed above, there are a number of flaws in Ofcom's estimate of a supposed fibre shortfall which all increase the estimated shortfall. Based on our assessment:

- Ofcom's quantitative analysis in no way rebuts the reasonable presumption that there is no fibre shortfall for the 3.2 million premises that Openreach has offered to pass; and
- There appears to be no justification for increasing regulated prices of copper-based services above a cost-based level for all customers in Area 3, if another mechanism can be found for incentivising full fibre roll out.

3.4 Ofcom could use a standard RAB framework in Area 3 to incentivise fibre investment

The aim of a RAB approach to setting regulated prices is to ensure that investors can make a sufficient and stable return on efficient investments, whilst constraining prices for customers. By providing investors with this long term certainty, this should help to reduce the required return on capital and thus feed through to lower prices for consumers.

A RAB approach is unlikely to send efficient build/buy signals for entrants. It is therefore more suitable for parts of the network which are not considered contestable, for example where infrastructure has high fixed costs or is difficult to replicate. This is why such approaches are typical in utility regulation, where reduced risk, and hence a lower cost of capital, are considered important.

The conditions in Area 3 are appropriate for utility style regulation/a RAB approach because:

- Ofcom assumes that (most of) Area 3 is a natural monopoly with limited scope for competitive fibre deployment;
- Fixed broadband is an essential service with a clear public need for reliable supply, which means that there is limited demand side risk; and
- Openreach owns the copper network, so can manage the transition to fibre.

Put another way, the priority in Area 3 is to ensure that Openreach is able to earn a sufficient (but not excessive) return on efficient fibre investments which meet policy objectives. There is limited need to send efficient build-or-buy signals given the limited scope for competitive fibre deployment. Adopting a RAB approach also

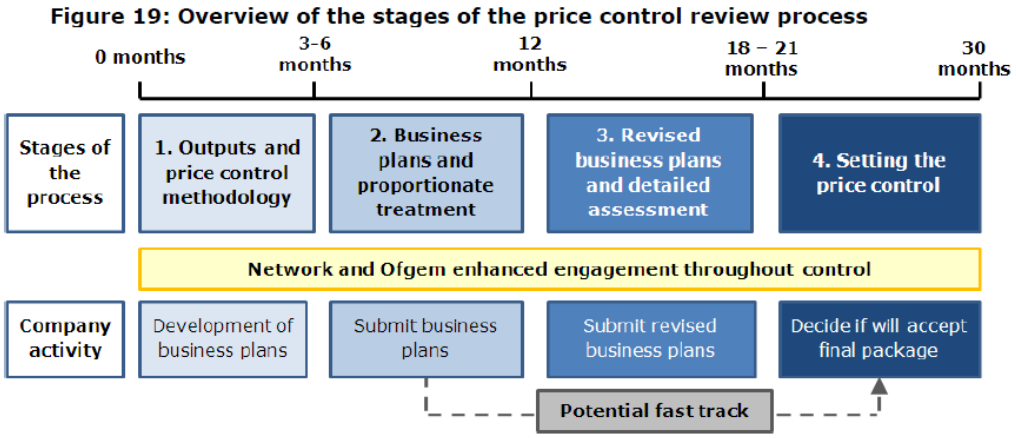
[65] *"While we do not expect widescale competing fibre networks to develop in Area 3 to the same degree as in Area 2, a number of providers have indicated that they have ambitions to build in Area 3."* (Ofcom – July 2020 consultation)

helps to provide some certainty about the regulatory framework beyond the next price control period, as it "locks-in" efficient investment. This would make it more difficult to move away from a RAB approach in future.

As noted above, Ofcom have attempted to apply elements of a RAB methodology but its approach of attempting to separate cash flows of a hypothetical legacy copper business from the incremental fibre cash flows from fibre is not a sustainable framework for long term regulation. The uncertainty this generates effectively undermines appropriate investment incentives, with Openreach only offering to invest in return for supra-normal profits, at the expense of consumers.

Regulators in other network industries (e.g. Ofgem and Ofwat) have extensive experience setting out frameworks for regulating natural monopoly infrastructure networks to the benefit of consumers, while providing adequate investment incentives. To determine the appropriate level for the cost-based charge control for copper services, Ofcom could implement a **best-practice RAB-approach**. Other UK regulators typically carry out in-depth reviews when determining how the RAB should be set for the next price control. For example, Ofgem process is shown by the following figure.

Figure 7 Ofgem's price control process



Source: Ofgem - Handbook for implementing the RIIO model (October 2010)

We set out below the aspects Ofcom should consider as part of its best-practice RAB approach as a policy option when considering the value for money of Openreach's offer. While there may be greater uncertainty over costs and demand for fibre networks, the framework is sufficiently flexible to ensure the resulting risks are shared appropriately between customers and investors.

3.4.1 Ofcom could place more focus on desired outputs

In other RAB based regulatory regimes there has been a shift in the regulatory approach from a focus primarily on cost reduction to a focus on the desired outputs, with the prices needed to efficiently achieve these outputs a result of the process.[66]

[66] The introduction by Ofcom of some quality of service regulation in the 2014 Fixed Access Market Review.

For example Ofgem, the UK energy regulator, made changes to the way in which it sets price controls for the energy sector back in 2010[67]. These changes were primarily driven by the need to invest to move towards a low carbon economy. RPI-X regulation had been in place for 20 years and had been successful in delivering cost reductions. But Ofgem considered that it was an ineffective approach for incentivising innovation and significant investments to accommodate renewables. Therefore, Ofgem developed a new framework, known as RIIO.

In Ofcom's case the primary "required output" is a level of fibre-roll out in Area 3. In Openreach's letter, there is no mention of what output targets it plans to meet other than the fibre roll out. To ensure that Openreach is delivering value to consumers, it should face a number of output targets to achieve what Ofcom considers to be a desirable level of full fibre coverage in Area 3, over a period of time. The output targets should cover aspects, such as fibre build/bandwidth and quality of service (fault rates). If Openreach fails to meet these output targets, then the allowed prices should be reduced. In the January 2020 consultation, Ofcom itself stated that a RAB-approach would typically involve:

> *"Ensuring Openreach delivers the investment - for example, assessing Openreach's delivery of its investment plans in each year in terms of aspects like network coverage and the quality of the services being offered."*[68]

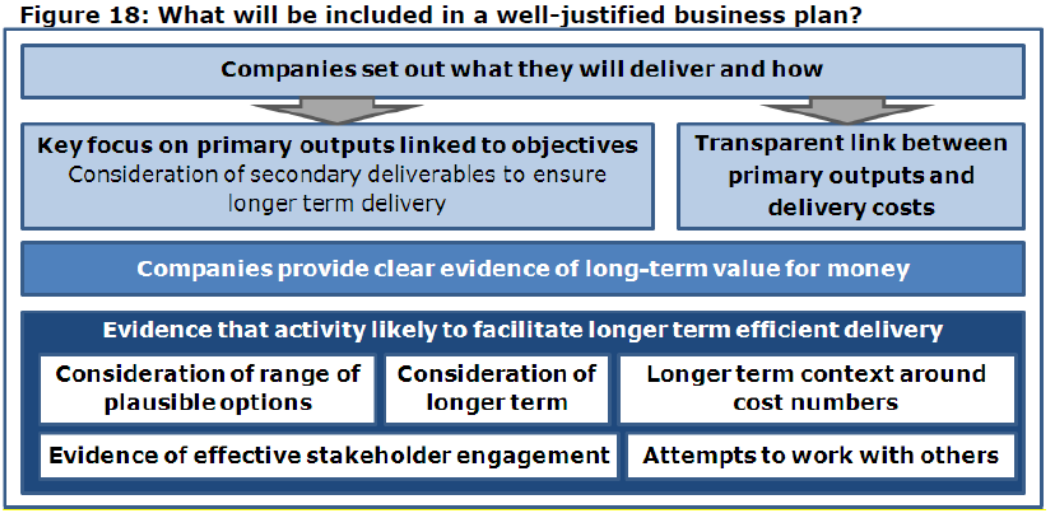
3.4.2 A well-justified business plan from Openreach could be part of a RAB approach

In other sectors, regulated entities now have to produce well-justified business plans which reflect the desired outputs. Outputs should be at the heart of the business plans – companies have to set out what network performance they are expecting to deliver. Companies also need to show that they have engaged with stakeholders and taken into account their views when developing their business plans. The components of a well-justified business plan are shown in the figure below.

[67] https://www.ofgem.gov.uk/ofgem-publications/51870/decision-docpdf

[68] 2020 WFTMR Volume 4: Pricing remedies, para 2.23

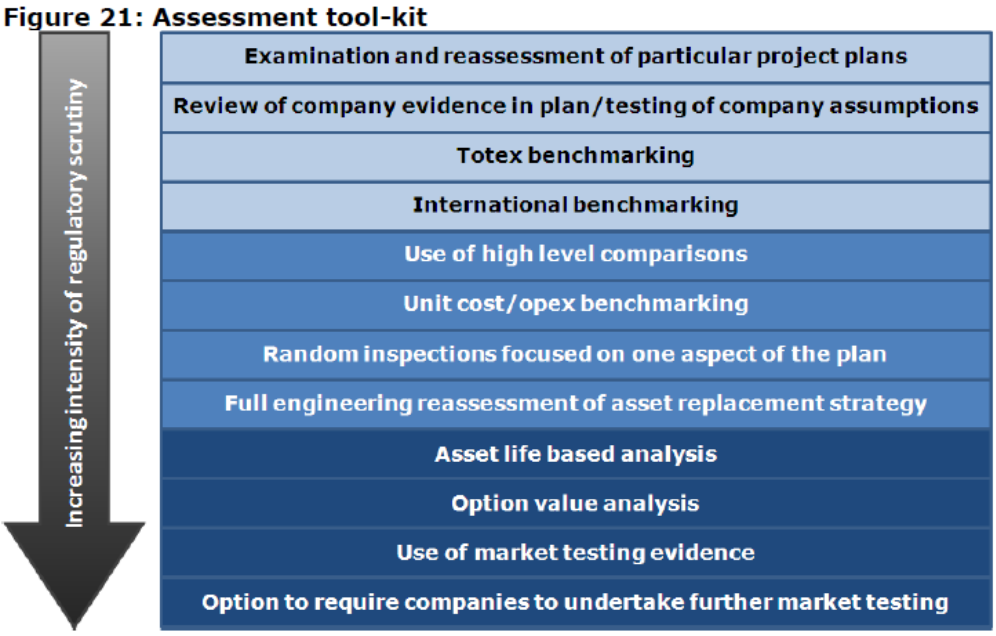
Figure 8 Ofgem's view of what should be in a well-justified business plan



Source: Ofgem - Handbook for implementing the RIIO model (October 2010)

The following figure shows some of the methods that Ofgem may use when assessing business plans.

Figure 9 Ofgem's assessment tool-kit for business plans



Source: Ofgem - Handbook for implementing the RIIO model (October 2010)

The business plans submitted by regulated entities tend to be very comprehensive. For example, when Western Power Distribution had its business plan fast-tracked in 2014 by Ofgem, they had produced a 784 page business plan[69].

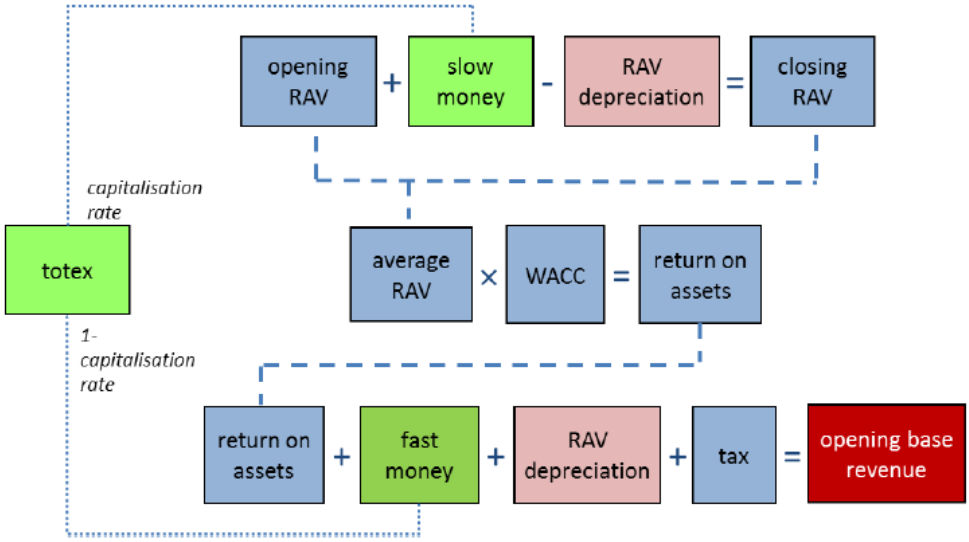
[69] https://www.westernpower.co.uk/docs/About-us/Stakeholder-information/Our-future-business-plan/WPD-RII-ED1-Business-Plan/WPD-RIIO-ED1-Business-Plan.aspx

Openreach should also have to produce a well-justified business plan for its fibre roll-out in Area 3 in any value for money assessment. It should be required to provide further details on its planned fibre roll-out in Area 3, whilst demonstrating how its roll-out plans provide value to consumers whilst also meeting output targets. Ofcom should then carry out a thorough assessment of Openreach's business plan.

3.4.3 The mechanics of setting allowable returns/revenues under a RAB based approach are well understood

Once a business plan is approved, the mechanics of determining allowable revenues are well understood. Ofgem's approach (Ofwat uses a similar approach) under RIIO is summarised in the following figure.

Figure 10. Energy price controls under Ofgem's RIIO approach[70]



Source: Ofgem (2017) Guide to the RIIO-ED1 electricity distribution price control

Under a RAB approach, the net value of the assets used to provide the regulated services is estimated at the start of the charge control period. This opening value for the RAB is then "locked in". The opening RAB value determines the costs that investors will recover from existing assets in the future (including a return on the unrecovered value of those assets, that is, a ROCE).[71] As such the decision on the methodology to calculate the opening RAB value is critical.

[70] Ofgem decides on how total costs (totex) are split between "fast money" and "slow money" based on its view of the network operators likely split of costs between opex and capex. Ofgem decided to adopt this approach as it was concerned that its previous treatment of capex and opex meant that operators had a higher incentive to seek capex-intensive solutions, as they preferred to have a higher RAB than have the costs expensed in the year in which they were incurred. Ofgem was also concerned that operators had an incentive to report costs as capex in cases where it was unclear whether a cost was capex or opex. Given the move towards using "fast money" and "slow money", the RAV no longer precisely corresponds to physical assets. Rather, the RAV represents simply the balance of unrecovered financial investment in the networks. Ofcom may not need to distinguish between "fast money" and "slow money", as it is not clear that Openreach has an incentive to favour capital-intensive solutions.

[71] The ROCE is calculated by multiplying the net value of the assets by the regulated rate of return – typically the regulated weighted average cost of capital (WACC).

As noted in Section 3.3.1, Ofcom have implicitly assumed that the opening RAB in Area 3 is the NPV of future cash flow from a hypothetical ongoing copper network in Area 3 with prices set at a nationally averaged level. This could reasonably be proxied by taking the CCA asset value for Openreach as a whole, from the BT Regulatory financial statements, pro-rated by the number of premises in Area 3.

The value of the RAB is then "rolled forward" each year to determine the closing value of the RAB.

The opening and closing value of the RAB is used to calculate the annual capital cost of the regulated assets. This consists of:

- Depreciation;
- Holding gain/loss based on the year average net value of assets; and
- Return on capital employed (ROCE) based on the mean RAB over the year multiplied by the appropriate Weighted Average Cost of Capital (WACC).

In order to calculate the total annual cost, operating costs should be added to the total annual capital costs.

Importantly, under the approach taken by both Ofgem and Ofwat, they only need to estimate efficient costs for the next charge control rather than having to estimate costs and revenues over the lifetime of the assets. This is because the RAB framework helps to provide the certainty that regulated entities will be able to recover any efficiently incurred costs in future charge controls by adjusting prices over time. This means that the approach taken by Ofgem and Ofwat is considerably easier to implement than Ofcom's approach towards estimating the fibre shortfall (which requires forecasts of costs and revenues over a very long time period).

Ofgem and Ofwat both set output targets for regulated entities – their allowed revenues will partly depend on their performance in terms of safety, environment, customer service, connections, social obligations, and reliability and availability. This is to make sure that regulated entities have the incentive to deliver value to customers.

3.4.4 There could be risk-sharing for over- and under-spend of expenditure

For over- and under-spend of expenditure, Ofgem and Ofwat impose a degree of risk-sharing between regulated entities and customers using an "incentive rate". The level of the incentive rate will determine the extent to which the RAB is adjusted in light of a given over-spend or under-spend. For instance, in the case of an over-spend in a given year, there will be an upward adjustment to the RAB but, as the incentive rate will be above zero, the adjustment will be smaller than the overspend itself. The higher the incentive rate, the larger the adjustment. As such, the RAB will not track actual expenditure but reflect a combination of expenditure forecast by Ofgem at the price control review and the actual expenditure incurred.

The degree of risk-sharing typically depends on the quality of the business plan submitted. For example, the following figure shows how the incentive rate varies in the water sector depending on the quality of the business plan.

Figure 11 Cost sharing mechanism

	More efficient business plans →						
Totex ratio[1]	70	80	90	100	110	120	130
Cost sharing rate for outperformance[2]	65%	65%	60%	50%	40%	35%	35%
Cost sharing rate for underperformance[3]	50%	50%	50%	50%	60%	65%	65%

[1] Ratio of company's view to our view of totex (%)
[2] Percentage of outperformance company gets to keep. The remainder is passed on to customers through lower bills.
[3] Percentage of cost overrun company has to bear. The remainder is passed on to consumers through higher bills.

Source: Ofwat - Delivering Water 2020: Our final methodology for the 2019 price review

It would make sense to also use a risk-sharing mechanism for Openreach in cases where its expenditure is over or under the forecast level similar to the 'gain share' mechanism used for BDUK.

4 OFCOM'S HAS NOT ASSESSED THE NET BENEFITS OF ITS AREA 2 PROPOSALS

In this section, we explain why Ofcom's proposals for higher prices to increase full fibre roll-out in Area 2 are unjustified:

- Ofcom has not shown a causal link between its proposals and fibre network investment;
- The link between copper wholesale charges in the next five years and returns on fibre investment will be weak;
- Network rollout announcements do not indicate that a 'price continuity' approach is required to support investment; and
- Ofcom's new entrant cost modelling indicates that lower FTTC prices are consistent with altnet FTTP investment incentives.

4.1 Ofcom has not shown a causal link between its proposals and network investment

Ofcom's own guidance on the assessment of costs and benefits makes clear the need to adequately assess causality:

> *"Only costs and benefits that would be reasonably incurred as a result of an option being implemented (as opposed to costs and benefits that would be incurred anyway) should be taken into account."*[72]

On the assumption that Openreach will price up to the charge control, there is a high degree of certainty on the direct costs through higher prices. However, the impact of this change on investment is clearly uncertain. The degree of uncertainty is likely to have increased recently, given the potential impact of COVID-19 on the broader economy and hence investment incentives.

Ofcom implicitly assumes in its discussion of the illustrative calculation of consumer benefits that a higher FTTC 40/10 wholesale price will directly result in an additional 5 million premises being passed by rival fibre builders with a high degree of certainty. Further, as noted above, Ofcom's rationale for choosing CPI-0 over tighter charge control options (in particular, cost-based) is that it considers that alternatives "*would be unlikely to promote network competition".* [73]

Ofcom also implies an indirect causal link with Openreach's incentives to invest, noting that the *threat* of competition supported by price continuity will in turn "*act as a strong incentive for Openreach to invest in high speed networks, due to the risk of losing volumes to competitors if it does not*."[74]

Ofcom has not however set out clearly why and how its proposed price control relaxation will incentivise incremental full fibre investment that would not have taken place under other policy options, e.g. those with lower price impacts on

[72] Better Policy Making 5.30

[73] Ofcom 2020, WFTMR Consultation, Volume 4: Pricing remedies, para. 1.74

[74] Ofcom 2020, WFTMR Consultation, Volume 4: Pricing remedies, para. 1.23

consumers. More specifically, Ofcom has not demonstrated that the higher wholesale prices under its price control proposals are both:

- **necessary**, in that a given full fibre investment would not be made in the absence of the higher regulated wholesale price; and
- **sufficient,** in that the resulting increase in expected returns (taking into account the indirect relationship between Openreach prices and altnet returns) would lead to a given full fibre investment being made.

Only for investment where the higher level of wholesale prices is both necessary and sufficient would Ofcom's proposals bring benefits. The size of this incremental quantum of investment will depend on the **level** and **variability** of investor returns across potential full fibre investments but also critically on the **power** of Ofcom's proposals – that is, the extent to which the choice between policy options makes an appreciable difference to the business case for rolling out fibre.

In the rest of this section we consider whether, in practice, CPI-0 is unlikely to have a material impact on investment of the order implied by Ofcom. With regards to altnet's investment incentives, we find that:

- the effect of allowing wholesale FTTC charges to rise in line with inflation in this charge control period will have at best a marginal positive impact on the business case for rollout by altnets, meaning the extent of the potential investment for which an increase in regulated charges is both necessary and sufficient is likely to be small.
- the network rollout announcements used as evidence by Ofcom of the effectiveness of its proposals provide very limited support for Ofcom's view that CPI – 0 is necessary to support altnet investment:
  - The degree of committed funding appears to be far less than indicated by announcements; and
  - It is not plausible to assume that rollouts that are currently underway hinge on Ofcom maintaining Openreach prices at their current level in real terms, particularly given that in recent years Openreach prices have fallen rapidly.

Even if it were the case that there was a material link between pricing of copper-based services and entrants' returns, Ofcom's own new entrant cost modelling indicates that lower FTTC prices are sufficient to support expected altnet investment. We discuss this further in Section 4.4.2.

With regards to BT's incentives, the marginal impact on altnet rollout in turn implies that the impact on the competitive threat faced by BT will be marginal. At the same time, higher legacy wholesale prices could in fact have a detrimental direct effect on its incentives to roll out fibre networks where BT does not face competition, which may include some premises within Area 2.

4.2 The link between copper wholesale charges in the next five years and returns on fibre investment will be weak

4.2.1 The impact of pricing in this market review period on overall returns on fibre investment in the period will be small

Fibre investments made in the next market review period will be recovered over the lifetime of the assets created, which for passive assets (duct and fibre cable) typically exceed 25 years. For investments made at the very beginning of the period, this means that approximately a fifth of the asset lifetime will be within the market review period. However, given the current rate of build of rival fibre networks and Ofcom's assumptions on the potential fibre build in the market review period, it is likely that build will be weighted towards the end of the market review period, which would meaning that on average less than one tenth of the life of the assets built within the next five years would fall into this period.

In addition, when forecasting revenues from new entrant fibre investments over their lifetime, the level of pricing in the initial years (i.e. with the market review period) will have reduced weighting due to the lower number of subscribers in the period immediately after roll-out, due to the need to acquire and connect the customer base[75].

4.2.2 In the long run broadband pricing will reflect competitive conditions or fibre network costs rather than regulated copper prices

Ofcom has set out proposals for a process through which regulation of copper-based services will be withdrawn after Openreach has met a 75% build targets in local exchange areas, with a 'stop sell' of copper based products initially and withdrawal of (copper) price regulation after 2 years or when fibre is fully built, whichever is the latest. Given Openreach's ambitions for fibre roll out, this means that copper price regulation could be withdrawn from a number of local exchange areas within the next market review period and potentially across most of Area 2 in the next decade.

Following the withdrawal of copper price regulation in an area, regulated copper prices clearly cannot determine broadband prices. Instead broadband prices should reflect fibre costs, either because they are set by competition between fibre-based operators or because Ofcom will regulate prices based on forward-looking costs.

[75] This effect will be offset to some extent by the discounting of cash flows in later periods when subscriber numbers will be higher.

4.2.3 Even in the short run the link between copper wholesale charges and the prices charged by entrants will be weak

Even for the relatively short period where regulated copper services co-exist with new entrant fibre networks there are important 'dilutive' effects, which will further weaken the potential impact of wholesale charges on investment returns:

- Previous modelling that we conducted for the 2018 WLA market review indicated that wholesale MPF/GEA prices will not be completely passed through to SFBB retail prices. This will dampen the potential impact of higher MPF/GEA on fibre returns.[76]
- Furthermore, as new applications and services that require ultrafast broadband (UFBB) speeds become available, substitutability between higher and lower broadband bandwidths will likely decline and this will reduce the extent to which increases in retail SFBB prices are reflected in UFBB prices.

Ofcom acknowledges in the WFTMR consultation document the dilutive impact of incomplete pass-through on the link between FTTC prices and altnet margins but dismisses this on the basis that "*wholesale prices directly affect incentives for investment without relying on pass-through to retail prices, as they directly affect the relative profitability of building (or sponsoring) a network in comparison to buying services from Openreach*"[77] and "*in any event [it is] is reasonable to assume a large proportion will be passed through given the retail market is effectively competitive.*"[78]

However, Ofcom's analysis of the link between regulated wholesale prices and fibre investment incentives overlooks the fact that:

- the ultimate investors in fibre networks to date have not been existing access seekers and as such the relative profitability of build-buy decisions for access seekers is not directly relevant, rather it is the expected level of retail (for vertically integrated operators such as Virgin Media) or wholesale (for wholesale only operators such as City Fibre) fibre prices that determines investment decisions;
- access seekers purchasing decisions are based on margins not costs, which are dependent on pass through to retail prices for both SFBB and UFBB as well as the relative levels of wholesale prices; and
- Ofcom has also not addressed the weakening link between the pricing of UFBB services (which will be an important driver of the business case for investing in fibre) over time and lower bandwidth services, which will dampen the impact of changes in the copper-based FTTC 40/10 price on the wholesale full fibre prices as well as retail prices.

[76] This modelling was submitted by TalkTalk but does not appear to be publicly available.

[77] Ofcom 2020, WFTMR Consultation Document, Volume 4, para. 1.20

[78] Ibid.

4.3 Network rollout announcements do not indicate that a 'price continuity' approach is required to support investment

Ofcom has not explicitly tested quantitatively the extent to which various options would support fibre build (and hence whether CPI-0 can be expected to deliver incremental investment), and the analysis above suggests that there is little causal relationship. Instead Ofcom appears to rely largely on operator announcements relating to rollout plans to support its position:

> *"The indications are that [our] approach is having an effect. Given the level of competitive network investment that is underway, we consider that the current level of price regulation would be consistent with our goal of promoting investment in high speed networks by Openreach and others, and that pricing continuity would allow this momentum to be sustained. Given the level of competitive network investment that is underway, we consider that the current level of price regulation would be consistent with our goal of promoting investment in high speed networks by Openreach and others, and that pricing continuity would allow this momentum to be sustained."*[79]

However, operator announcements/ rollout to date provide no/limited evidence to suggest that maintaining prices at their current level (in real terms) is necessary to support altnet investment compared to other options. We find that:

- there is no evidence of a causal relationship between changes in Ofcom's regulatory strategy and altnet rollout announcements;
- actual rollout to date (as opposed to announcements) by altnets has been limited; and
- operator announcements provide limited insight into the level of actual investment that can actually be expected.[80]

Even Ofcom's view that pricing continuity is necessary to support investment that is *already* underway is unevidenced. Altnets' management and investors should take a forward-looking view on the key factors that might affect their returns when deciding whether to commit to a project. Investors will consider the overall regulatory framework, including Ofcom and Government initiatives focussed on the reduction of the cost of full fibre roll-out.

As indicated above, we have not been able to identify strong/robust evidence that investor investment plans/roll-out were affected positively from Ofcom's July 2018 announcement in relation to price continuity. We have also shown why the level of the regulated cost-based FTTC 40/10 prices, based on Ofcom's own analysis, is unlikely to affect new entrant investment plans.[81]

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79 Ibid, para. 1.17

80 See Annex B for details.

81 Investors will have a preference for higher regulated prices, but this does not in itself indicate that any change in regulated prices will have a material impact on investment.

In addition, we would expect altnets to have factored in the potential competitive response from Openreach, who may be incentivised to set access prices below the cap following altnet entry in order to protect its network market share and position as an operator with market power. Indeed, the current Openreach GEA FTTC volume discount offer illustrates its willingness to set prices below caps set by Ofcom, where it considers it is profitable to do so. It therefore does not seem plausible to assume that the business case of rollouts that are currently underway are contingent on Openreach maintaining prices at their current level in real terms.

4.4 Ofcom's new entrant cost modelling indicates that lower FTTC prices are consistent with altnet FTTP investment incentives

As discussed above, price regulation of copper services in the next market review period can only have a relatively small impact on the overall returns from fibre investment.

While it is not clear from Ofcom's documents, Ofcom appears to believe that copper price regulation in this market review period could affect expectations of long run prices, even though Ofcom has clearly signalled copper price regulation would be withdrawn relatively quickly.

In this section we use evidence from Ofcom's new entrant cost modelling, presented in the consultation document, to assess the impact of adopting a CPI-0 approach on the profitability of fibre rollout, as compared to a CPI-CPI or cost-based approach on the assumption that this influences the long run level of fibre prices. This in turn helps us to assess whether there is any evidence that CPI-0 is both necessary and sufficient to support altnet investment.

4.4.1 Ofcom's 'price-cost test' indicates that new entrant revenues would exceed costs by a comfortable margin under CPI-0

To check whether the level of prices under a proposed price cap for copper-based 40/10 FTTC (i.e. GEA 40/10 + MPF) in Area 2 will be sufficient to support investment in fibre by alternative networks, Ofcom has conducted a 'price-cost' test, which compares expected revenues with the estimated unit costs for a new fibre network covering 3.5 million premises.

The idea behind the 'price-cost' test is as follows:

- To the extent that copper-based 40/10 FTTC services are a substitute for full fibre (FTTP) services and hence act as a constraint on FTTP wholesale pricing, the revenues earned by a new entrant can be modelled as the 40/10 FTTC wholesale price plus a 'mark-up' which represents the premium that consumers are willing to pay for the superior services offered over FTTP (in particular the higher bandwidth available and other network quality dimensions such as reliability).
- The expected revenues at different levels of 40/10 FTTC charge can then be compared to the expected unit cost (taking into account the cost of capital), that

a new entrant operator would face – where the expected revenues exceed the expected unit costs, this implies that the 40/10 FTTC charge is sufficient to support investment.

Ofcom has estimated the unit costs for a fibre builder by converting capex and opex estimates from its bottom-up fibre cost model to a flat annuity over a 20-year modelling period. It then compares this with an estimate of the expected revenues for an altnet, given the proposed level of 40/10 FTTC charge:

1. **The fibre cost modelling** indicates that the unit cost of supplying FTTP services for an alternative network operator ranges between **£8.50 and £12.75,**[82] depending on assumed take-up (which varies between 30% and 40%) and DPA usage (which varies between 40% and 50%); and
2. To estimate the **expected revenues**, Ofcom assumes that FTTP wholesale access for an altnet would/could be priced at a premium of £1.50 - £4 on top of the 2020/21 40/10 FTTC + MPF charge of £12, which gives **£13.50 - £16.**[83]

Taking the mid-point of each of the above ranges, this implies that, by Ofcom's own estimation (which, as explained below, we consider to be conservative) the expected average revenues for an altnet from the provision of FTTP would be above the expected unit cost by a comfortable margin: £14.75 average revenue vs £10.63 average cost, equating to **a margin of more than £4 or around 40%.**

4.4.2 Investment could be supported under a tighter charge control

Whilst Ofcom has used its 'price-cost' test to check whether holding the 40/10 FTTC charge at its current level in real terms would be *sufficient* to support altnet investment, it has not considered whether it is *necessary*.

As explained above, given the inevitable cost to consumers associated with higher wholesale access charges, it is important that Ofcom considers whether allowing prices to rise with CPI is actually likely to deliver material *incremental* investment relative to less costly options. To help assess this, we have also compared the outputs from Ofcom's price-cost test with the likely level of charges under:

- **A 'cost-based' approach**: assuming that Ofcom continues with its current approach, of regulating the 40/10 FTTC charge in line with BT's costs as described in Section 5.
- **A CPI-CPI approach:** in other words, holding the 40/10 FTTC cap flat in nominal, rather than real terms (and hence applying zero inflation)**.**

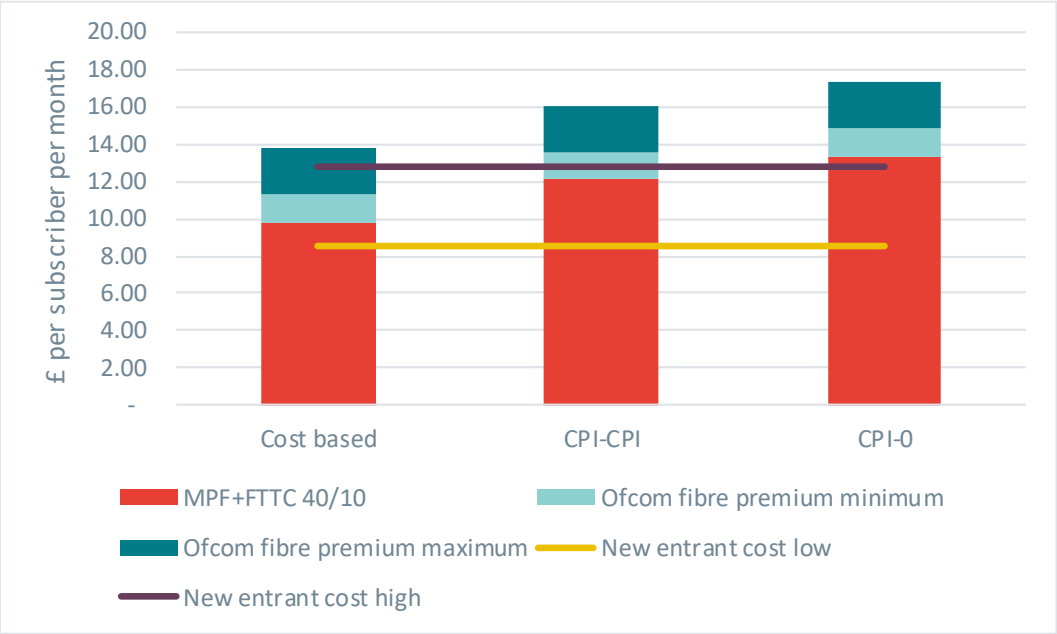
As shown in the chart below, the outputs from Ofcom's model imply that **either of the above approaches would still yield expected fibre wholesale revenues that are generally**[84] **above Ofcom's estimate of the average unit costs of a new entrant fibre network** and hence support altnet fibre build.

[82] Ofcom, January 2020, 2020 WFTMR Volume 4: Pricing remedies, para. 1.80 (a)

[83] Ofcom, January 2020, 2020 WFTMR Volume 4: Pricing remedies, footnote 27

[84] Only where costs are at the upper end of Ofcom's range and the fibre premium is at the lower end of Ofcom's range is the level of prices implied by a cost based approach fall below the new entrant costs.

Figure 12 Expected fibre wholesale revenues versus new entrant fibre network unit costs



Source: Frontier analysis of Ofcom cost modelling

4.4.3 Ofcom's assumptions on the fibre price premium appear unduly conservative

In the long run, the fibre price following copper switch-off will ultimately be set by competition (or regulation), rather than as a premium to the copper price.

Ofcom has assumed that full fibre (FTTP) services would only command a modest premium compared to copper-based 40/10 FTTC (in the region £1.50 to £4) during the period where copper and fibre co-exist. However, a small premium is arguably inconsistent with the strategy of incentivising investment in fibre.[85]

Ofcom notes that the wholesale fibre premium will have three elements:

- Increased reliability of fibre services compared with equivalent copper services leading to increased customer willingness to pay;
- Reduced costs for access seekers due to the increased reliability of fibre networks reducing the cost of customer management for fault repairs; and
- The increased capability of fibre networks, in particular higher bandwidths.

Ofcom has estimated the first element to be approximately £1.10 per subscriber per month.[86]

Ofcom has estimated the second element to be between £0.40 and £0.75 per subscriber per month.[87]

[85] This is also true in Ofcom's approach to Area 3, which we discuss in Section [4].

[86] A22.8

[87] A22.14

This leads to a premium on a like-for-like service, e.g. a 40/10 broadband services, of between £1.50 and £1.85 per subscriber per month. Ofcom is proposing to allow Openreach to set full fibre FTTP 40/10 prices with a premium of £1.85 per subscriber per month following 'copper switch off'. Given Openreach's ambitions to roll out to 20 million premises and Ofcom's proposals to allow timely copper switch off, this means that new entrant fibre operators can expect a premium of £1.85 over the 40/10 copper-based FTTC price for an equivalent service, above the lower end of the range suggested by Ofcom. However, this is a lower bound for the overall premium as new entrant fibre operators will be able to also charge a premium for higher bandwidth.

While some customers will seek the lowest possible price, retailers and hence wholesalers will be able to achieve a higher premium by offering higher bandwidth services at a premium to this base price. Ofcom's implicit assumption is that this premium is modest. This appears to be based on their analysis of current pricing in the market which suggests that there is not a large differential between ultrafast vs FTTC comparing offers across different platforms. Ofcom infers from this that the willingness to pay for higher speeds is therefore modest.

However:

- Given that the rollout of fibre networks is at a fairly early stage, we would expect ultrafast services delivered over these networks to be relatively aggressively priced to encourage migration, particularly for small vertically integrated altnets such as Hyperoptic that have limited brand profile;
- Looking at the pricing distribution *within* operators' portfolios, rather than across operators, reveals some substantial differentials (c. £10/month for Virgin Media 350Mbit/s vs 50Mbit/s, £40/month for Gigaclear 900Mbit/s vs 30Mbit/s);
- In addition, there is evidence that once customers have upgraded they tend to have a limited propensity to downgrade (perhaps because higher speed services have 'experience good' characteristics), which would imply that the profit maximising premium will rise over time as customers migrate to higher speeds.

To the extent that the value that consumers place on higher speeds is expected to increase over time, the premium that they would be willing to pay will also increase. If this were not the case, then this would imply that even on a forward-looking basis, the incremental value to consumers delivered by full fibre compared to FTTC is modest. This would in turn undermine the rationale for incentivising investment in ultrafast services.

4.4.4 Conclusion on the impact of a tighter charge control

As was seen above, even with tighter charge controls, prices would be set at a level where a new entrant would be able to make sufficient returns to cover its costs, even as per Ofcom's own modelling. Thus, if Ofcom's objective is to encourage investment, this can be achieved through either CPI-CPI or cost-based charge controls.

Furthermore, as Ofcom's objective should also be to ensure good outcomes for consumers, it is unclear how choosing CPI-0 achieves this. This is because the

higher investment can be achieved at lower costs to consumers through CPI-CPI or cost-based charges, and these cost savings are not trivial. As we demonstrate in Section 5.3 cost-based charges could save consumers around **£3.2 billion** between 2021/22 – 2025/26.

At a time when Ofcom claims to want consumers to get a fair deal for their services, and given the importance of affordability in the midst of the COVID-19 crisis, a choice of CPI-0 must be justified. This is especially important as the proposed approach appears to impose additional costs on consumers for no material benefit compared to a tighter charge control.

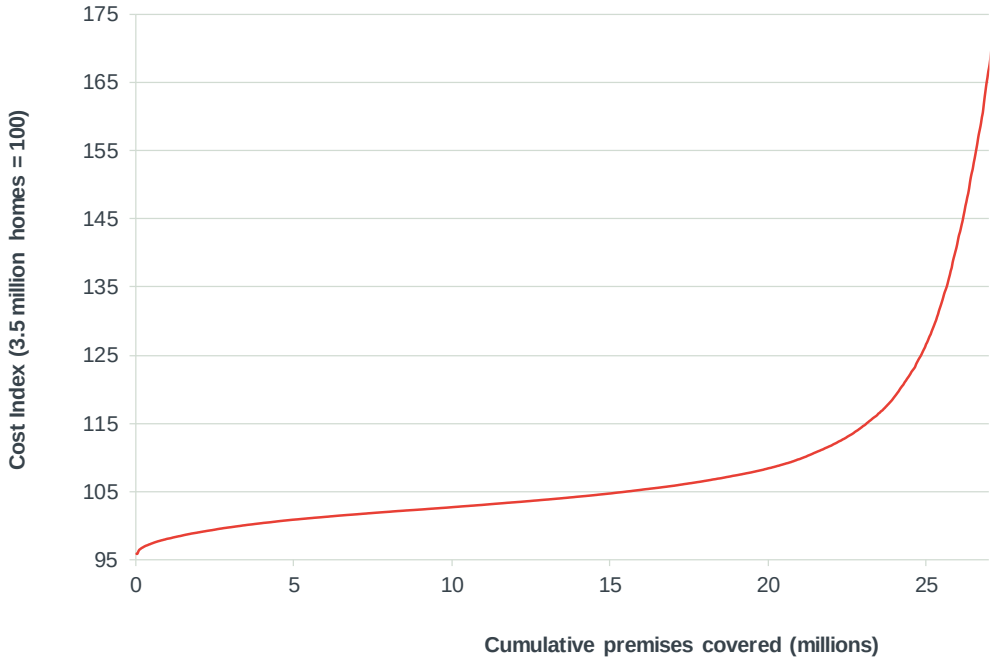
The above results would likely hold well beyond 3.5 million premises

We note that Ofcom's price-cost test is based on costs of altnet deployment to a fixed number of premises (3.5 million). In theory, setting higher wholesale charges for copper-based FTTC services could expand the scope of roll-out (i.e. beyond the first 3.5 million), by making more and more 'areas' profitable if they were in the band where costs are such that a CPI-0 charge control is both necessary and sufficient.

However, since the distribution of household density (the key driver of rollout costs) in the UK is such that the cost curve for fibre deployment in potentially competitive areas (i.e. the first c. 70% of premises) will be fairly flat: this can be seen from the below chart, which plots the relative cost of deploying to premises across the UK. Between 3.5 million and 10 million premises we estimate that the capex per home passed increases by less than 3%.[88]

[88] Based on publicly available data on average road length per premise, calculated at the Output Area (OA) level, combined with Prism cost data used for an NIC study, available here: https://www.nic.org.uk/wp-content/uploads/Cost-analysis.pdf.

Figure 13 Cost curve for FTTP roll-out – cost per premises passed indexed to the cost at 3.5 million premises



Source: Frontier analysis of publicly available data

As such, the results set out above are likely to hold for deployment well beyond 3.5 million premises. Further, given the supply constraints on rolling out fibre networks, in the next market review period, altnets are unlikely to have exhausted opportunities in lower cost areas and be rolling out network in those areas where costs are at a level where the increase in regulated wholesale prices is both sufficient and necessary (and the number of such areas is likely to be small given the gradient of the curve at this point).

5 COSTS TO CUSTOMERS

5.1 Setting prices above the level required to incentivise investment leads to a net cost to consumers

Any potential benefits of Ofcom's proposed approach, in particular, the impact on fibre investment must be weighed against the costs, relative to alternative policy options – in particular, a cost-based control or a CPI-CPI approach.

Adopting CPI-0 will result in higher costs to consumers, compared to the above-mentioned alternatives, since operators would be expected to pass on some portion of the increase in wholesale charges to retail prices.[89]

The fact that the evidence in the preceding section indicates that there are no material benefits in allowing regulated wholesale charges to increase in nominal terms implies that Ofcom's proposals effectively result in a net cost for consumers, i.e. customers incur costs with no offsetting benefits.

In the rest of this section we set out that:

- Ofcom's estimate of Openreach's over-recovery under CPI-0 understates the loss in consumer surplus.
- Based on our own modelling the direct costs to consumers, due to higher retail prices, could be around £3.2 billion under CPI-0 over the course of the review period compared to a cost-based approach.
- There are also other reductions in economic welfare, for example the degree to which increases in consumer prices will reduce demand for broadband services.
- In addition to the impact on total costs, there are important distributional impacts that should be considered. A key issue is that many households will end up paying higher prices for their broadband services without having the opportunity to upgrade to full fibre services.

5.2 Ofcom's approach under-estimates the costs to consumers of its proposals

5.2.1 Ofcom has not adequately defined the counterfactual scenarios underlying its cost model

Ofcom has not attempted to estimate the increase in costs faced by retail consumers under the various potential options. However, Ofcom does present estimates at a wholesale level of Openreach's over-recovery on copper-based access products under CPI-0, relative to those that would be set under a cost-based charge control for all copper-bsaed access products. In its January 2020

[89] Even if there were offsetting retail margin reductions the level of retail prices would be higher than in the options where regulated prices were on a CPI-CPI basis or based on a cost-based charge control.

consultation, Ofcom estimated that the wholesale over-recovery would amount to around £650 million in total over the five-year charge control period in Area 2.[90] In its July 2020 consultation Ofcom estimated that the wholesale over-recovery in Area 3 would amount to £313 million in NPV terms over the five-year charge control period.[91] . Neither of these overcharge estimates include the excess profitability for leased line services. However, as we discuss below, inconsistencies in Ofcom's approach to cost modelling mean these costs are underestimates of the true increase in Openreach profitability between Ofcom's proposals and the alternative of a cost base charge control.

Ofcom's cost modelling has been used for two purposes:

- In Area 3 to define the baseline 'do nothing' scenario against which cash flows resulting from the BT offer being accepted are assessed in a RAB framework; and
- In Area 2 to assess the degree of excess profits BT will earn if Ofcom sets a CPI-0 charge control compared to if it were to set a cost based charge control.

In both cases Ofcom is effectively attempting to determine the 'counterfactual' scenario to its proposals. However, Ofcom has not clearly defined key aspects of these counterfactual scenarios, leading to logical inconsistencies between the assumptions within the cost modelling and the counterfactual scenario that the model is attempting to represent.

This has occurred because Ofcom has populated the cost model with assumptions which appear to be based on its expected out-turn following the implementation of its proposals rather than the expected out-turn if alternative proposals were implemented, e.g. the counterfactual scenario.

Ofcom's assessment of the impact of its proposal in Area 3

These logical inconsistencies are clearest when considering the use of the cost modelling to assess the value for money of BT's offer in Area 3. In this case the counterfactual is that BT's offer is not accepted and so under Ofcom's assumptions BT would not roll out to the 3.2 million premises in Area 3.[92] This would mean that customers would remain on the Openreach copper network.

As customers would remain on the copper network under this scenario:

- there would be no reduction in demand for copper services due to migration of customers to fibre services; and
- there would be no 'stranding' of copper cable assets due to 'copper switch off' following migration of subscribers.

As such the appropriate approach to cost modelling under the baseline 'do nothing' would be a copper based (hypothetical) ongoing network with broadly constant demand (as broadband customers would have no fixed alternative). However, in Ofcom's modelling for Area 3, it has calculated the costs of copper services for the

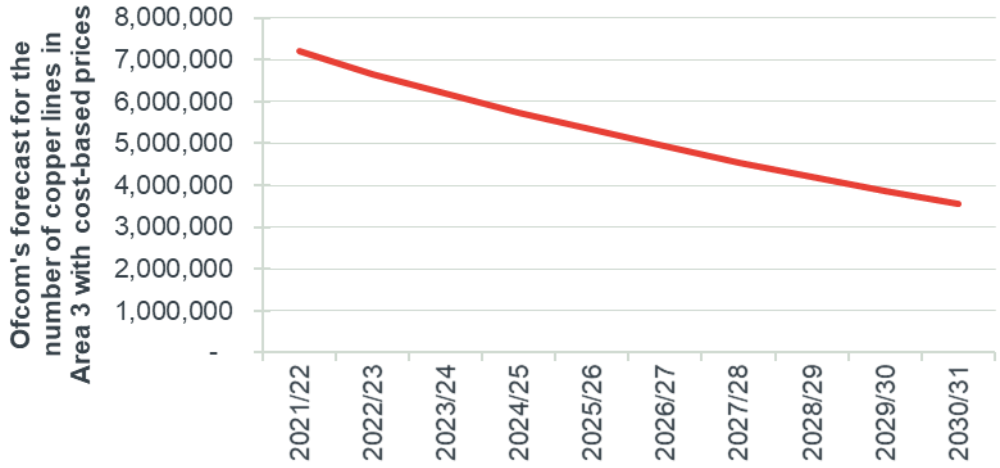
[90] Ofcom WFTMR, Annex 16, Table A16.7

[91] Ofcom, July 2020, WFTMR 2021-26: Proposed approach to pricing WLA services in Geographic Area 3, para 3.25

[92] Ofcom include all 3.2 million premises when calculating its estimate of the 'fibre shortfall'. If BT or another operator were to roll out the fibre network in any case then there would be no need to accept BT's offer

'do nothing' scenario using demand inputs which assume a rapid migration away from copper services (see Figure 14) to a fibre network, which would be non-existent under this scenario.

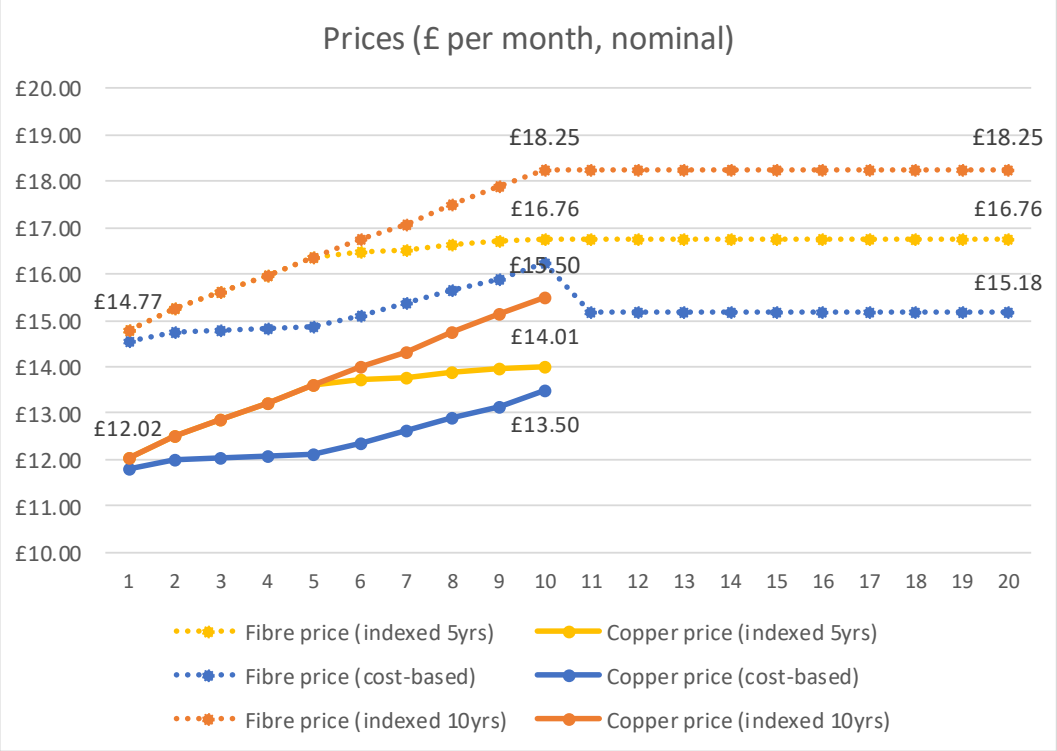
Figure 14 Ofcom's forecast for the number of copper lines in Area 3 under a cost-based charge control for copper services



Source: Based on Ofcom's "dcr-area-3-model" spreadsheet

The cost model also includes an upwards adjustments to the cost of copper services to account for assets which Ofcom assume will be 'stranded' following copper switch off, even though copper switch off would not occur in this scenario. This combined with the fast decline in copper volumes, leading to a reduction in economies of scale, results in a forecast a rapid increase in the 'cost based copper price' as seen below.

Figure 15 Ofcom's assumptions on pricing for different scenarios



Source: Ofcom dcr-Area 3 model

These clear logical inconsistencies mean that Ofcom's assessment of the increased profits accruing to Openreach under a CPI-0 control (the difference between the blue and the yellow or orange lines) are significantly understated. This also understates the cost of the proposal to end users who would not face the increased copper based prices forecast by Ofcom, in the counterfactual.

Ofcom has underestimated the costs of its proposals in Area 2

A similar effect would be expected in Area 2 as, if Ofcom's proposals for a CPI-0 charge control stimulate fibre build (as Ofcom assumes), then logically under a lower cost-based charge control, the premises passed by rivals and Openreach fibre build will be lower. The degree to which it will be lower should be consistent with Ofcom's assumptions of the benefits of a CPI-0 approach. In addition, even though there would be some degree of copper switch off under the counter-factual, Ofcom's inclusion of an upwards adjustment for 'stranded assets' is not consistent with the regulatory precedent on how to set efficient charge controls in a period of technological change. These issues are explored in more depth in Annex B.

5.2.2 Ofcom's impact assessment should be updated to reflect corrected cost estimates

This lack of a clearly defined counterfactual scenario with estimates based on inputs inconsistent with this scenario has significant implications for Ofcom's assessment of its proposals:

- In Area 3 when comparing revenues under a CPI-0 charge control with a cost based charge control in the absence of fibre build, Ofcom has significantly underestimated the excess profits that would be earned by BT in return for its (non-binding) offer hence distorting the value for money assessment;
- In both Area 2 and Area 3, Ofcom has significantly under-estimated the costs of its proposals compared to a cost based charge control when (implicitly) considering the balance between consumer protection and benefits in terms of increased fibre build.

5.3 We estimate that costs to consumers will be around £3.2 billion higher under CPI-0, compared to a cost-based approach

We do not have sufficient access to the inputs to the cost model Ofcom uses to forecast cost-based wholesale copper/ FTTC charges under alternative assumptions. We are therefore unable to fully address the issues with Ofcom's approach by running the model with appropriate demand assumptions for a counter-factual scenario. We have therefore based our assumptions of a cost-based charge control for the level of costs in 2025/26 on the following:

- We have assumed that the cost-based MPF will be constant in nominal terms from 2019/20 onwards[93], i.e. £84.10 line/year[94].
- We have taken the average cost for GEA FTTC rental from Ofcom's costs model for 2025/26 as is, before the Ofcom's re-allocation of 'stranded asset' costs to GEA FTTC, i.e. £40.10 per year.
- We have applied the tariff gradient assumption used in the 2018 WLA charge control to de-average the average cost of GEA FTTC across all bandwidths to give a cost for the 40/10 service. In the 2018 WLA charge control the tariff gradient resulted in the 40/10 service being priced at 84% of the average GEA FTTC cost. Applying this percentage gives a GEA FTTC 40/10 target price of £33.62.

We consider these assumptions to be reasonable:

- The MPF cost has been broadly stable in nominal terms in recent years despite a significant increase in unit business ('cumulo') rates over time attributed to MPF, which we would not expect to continue indefinitely;
- We have not adjusted the underlying GEA FTTC unit costs to take account of Ofcom's unrealistic assumptions on rival fibre overbuild in the model, which would be expected to inflate these costs;
- Using the tariff gradient from the 2018 WLA appears consistent with Ofcom's view at this point:

> *"we have set the GEA 40/10 regulated price in this charge control period to maintain the current bandwidth gradient based on Openreach's current prices, and* ***note our current view that***

[93] The Ofcom model estimates the cost of MPF will increase materially over time (excluding the adjustment for scrap copper), apparently largely due to declining volumes.

[94] Taken from the 2020 BT RFS

> ***in future reviews it is unlikely to be appropriate to update the pricing gradient or volume forecasts for higher bandwidths*** *(barring a significant change in expected circumstances).*[95]

We then assume a cost based charge control would impose a glide path from current prices to the cost based level in 2025/26.

The projected prices under this approach are set out in Figure 16.

Figure 16 Cost-based price projections for MPF and GEA – 2020/21 – 2025/26 (£/line per year)

Wholesale product	2020/21	2021/22	2022/23	2023/2024	2024/25	2025/26
MPF	85.38	85.12	84.87	84.61	84.35	84.10
GEA 40/10	59.88	53.35	47.54	42.36	37.74	33.62

Source: Frontier analysis

5.3.1 We estimate that the consumer welfare loss from CPI-0 would be in the range £2.7 billion to £3.6 billion

We have estimated the total welfare loss under a CPI-0 approach as follows:

1. We estimate the difference (delta) in regulated FTTC wholesale charges, between CPI-0 and the cost-based scenario for each year of the upcoming review.
2. The delta in retail prices in each of the above scenarios is then estimated by applying to our estimated wholesale deltas the indicative range for the likely level of pass-through cited in the WFTMR consultation document, of 65% - 85%[96] with 75% as the central case and applying the VAT rate. We assume that the retail price delta is equal to the estimated delta for 40/10 FTTC services for all broadband services.
3. The retail deltas in each year are then multiplied by the total projected number of residential access lines for MPF and residential broadband users for the FTTC price.

The table below sets out the estimated (nominal) consumer welfare loss over the course of the upcoming review.

Figure 17 Range of estimated increase in total consumer cost 2021/22 – 2025/26

Assumed pass-through from wholesale to retail prices	CPI-0 vs Cost-Based (£million)	Per broadband customer (£)
65%	2,743	104
75% (central case)	3,165	120
85%	3,588	136

Source: Frontier Analysis

[95] Ofcom WLA statement Vol 2, para 2.88

[96] Ofcom 2020 WFTMR Consultation, Volume 4, page 6, footnote 6

5.4 There are additional costs associated with Ofcom's proposals that should be considered

The above analysis considers only the direct costs to consumers as a result of over-recovery by BT and therefore does not consider broader changes in economic welfare – in particular the analysis assumes that households will accept that they have to pay higher broadband prices rather than reducing their demand for broadband services. However, in reality, some households may decide to reduce their demand for broadband services (either by downgrading broadband service or disconnecting their broadband service completely). A reduction in demand would lead to two costs:

- A deadweight loss from the loss of economic surplus from those customers; and
- A further reduction in externalities due to the reduction in overall broadband penetration.

In its 2018 Access and Inclusion report, Ofcom presented evidence that there was a significant number of customers struggling to pay for fixed broadband services with 9% of customers having difficulties paying for one or more communications services[97] and 2% of customers having cancelled or not having fixed broadband service due to cost[98]. Post COVID-19 it is possible that a significant proportion of households will be in financial distress, increasing the proportion of consumers who may give up fixed broadband services in the event of price increases.

In terms of externalities, analysis commissioned by Ofcom[99] shows that broadband penetration appears to be strongly associated with productivity and hence GDP growth, with the relationship much stronger than the association with broadband speeds. COVID-19 has also shown there is a wider set of externalities with respect to fixed broadband penetration, with fixed broadband enabling a range of activities including remote working, online classes and online health during lock down. High penetration of fixed broadband at the beginning of lock down has enabled these activities.

As such, our above estimates of the consumer costs could understate the total welfare loss.

5.5 Important distributional effects have not been evaluated

In addition to the impact on *total* costs, Ofcom's guidance on impact assessments requires that it considers distributional effects:

> *"In relation to citizens or consumers, we will often need to consider the impact on different groups. For example, we may*

[97] https://www.ofcom.org.uk/__data/assets/pdf_file/0019/132913/Access-and-Inclusion-2018-Annexes.pdf Table 4

[98] https://www.ofcom.org.uk/__data/assets/pdf_file/0027/121977/affordability-tracker-2018-data-tables.pdf page 168

[99] The economic impact of broadband: evidence from OECD countries Pantelis Koutroumpis April 2018

> *have to consider the impact of options on the interests of people living in different parts of the country or on people who are elderly, disabled or on low incomes.*[100]
>
> *The distributional impacts which the different options would have should also be taken into account and, where possible, quantified. A distributional impact is an impact which is transferred rather than being additional e.g. a policy might benefit consumers in urban areas at the expense of consumers in rural areas, while the net benefit remains the same. Clearly this would be a relevant consideration even though it would not be revealed by a narrow analysis of the costs and benefits."*[101]

It is clear that in this case the effects of the policy will not be uniform across all consumers:

- An increase in prices of copper-based services will be more likely to lead to less well-off customers leaving the network as Ofcom's analysis of affordability shows that difficulties in paying for communications services is concentred in groups such as socio-economic group DE and long term disabled, while the benefits of full fibre competition may be concentrated on higher income customers.
- The direct consumer benefits will be enjoyed only by those customers who are within the area of incremental infrastructure (5 million households in Ofcom's illustrative example) and consume FTTP services, while the cost is borne by all consumers in Area 2 (around 21.3 million lines based on Ofcom's current estimates). Similarly, in Area 3, Ofcom's analysis assumes that only those consumers who are within the 3.2m premises that form part of Openreach's fibre commitment (and decide to upgrade to full fibre services) will benefit from its proposals despite the costs being borne by all 9.2m premises in Area 3.

While there may be some spill-over effects of greater competition for consumers into the parts of Area 2 where rivals do not invest as a result of nationally uniform pricing, this may not be the case in relation to other dimensions of competition. As Ofcom's analysis suggests that rival infrastructure is likely to be concentrated in more urban areas, overall there is likely to be a net transfer from less urban to more urban consumers. In Area 3, there will be no positive spill over effects to households outside of Openreach's 3.2m commitment due to increased competition given that Openreach will be the monopoly provider.

[100] Ofcom Better Policy Making paragraph 5.19

[101] Ibid 5.34

5.6 The COVID-19 crisis increases the social value of access to affordable *superfast* broadband

5.6.1 SFBB has performed/is performing well in meeting the needs of workers and households working from home during the lockdown.

As mentioned above the introduction of strict social distancing measures lead to a surge in network traffic – for example, on 20 March 2020 BT issued a news release which said that indicating that there had been a 35-60% increase in weekday broadband traffic on its network since the Prime Minister's 16 March 2020 statement asking UK residents to stop all unnecessary travel and start working from home where possible[102]

Despite this surge in demand, networks have generally coped well with the increase in traffic – Ofcom found in its May 2020 UK Home Broadband Performance study that "*Comparing performance during the first and last weeks of March 2020 (pre-and post-lockdown) … average download and upload speeds fell only by 2% and 1% respectively*"[103]

This reflects the fact that broadband providers scale their networks so that they can handle capacity requirements at peak times, and while the COVID-19 lockdown resulted in significant growth in daytime data consumption, this usage was still below the level of pre-lockdown evening peak demand.[104]

The fact that usage was still below the pre-lockdown evening peak also suggests that the bandwidth offered by existing networks – in particular, Openreach's superfast copper-based FTTC network – has been sufficient to meet the requirements of consumers during lockdown and that there could also be sufficient 'headroom' in the FTTC network to absorb any longer-term/ sustained shifts in usage resulting from the crisis, explored below.

5.6.2 Increased remote working and usage of online services in the longer-term would increase externality benefits of 'universal' SFBB broadband connections

The surge in data traffic of fixed networks during lockdown reflects the central role that telecoms has played in helping households adapt to the crisis and in keeping the economy functioning.

Whilst increased demand for broadband services is an immediate effect of lockdown measures, that would be expected to diminish to some extent as restrictions are eased, the crisis nonetheless highlights the significant externality benefits associated with widespread access to decent broadband – in particular, it

[102] https://newsroom.bt.com/the-facts-about-our-network-and-coronavirus/

[103] https://www.ofcom.org.uk/about-ofcom/latest/media/media-releases/2020/broadband-networks-during-pandemic

[104] Ofcom May 2020, UK Home Broadband Performance: The performance of fixed-line broadband delivered to UK residential customers, page 9

enables a range of activities that have a positive impact on the wider economy including remote working, online classes and remote access to health services while reducing transmission of the virus.

In addition, there seems to be a broad consensus that the crisis will herald a longer-term boost in usage of/reliance on residential broadband services which will in turn strengthen the importance of these externalities – in particular, survey evidence suggests an increased desire for (or at least acceptance of) remote working amongst both employers and employees:

- A survey of 3,000 adults by Halifax shows found that "*Almost one in three employees are planning to keep working from home after the coronavirus restrictions end*"[105]
- On the employer side, a recent survey of 150 companies listed in the Fortune 200 rankings found that 85 per cent were planning to expand remote working policies as a direct result of their employees' experiences over the lockdown.[106]

Similarly, a June 2020 survey from the British Medical Association indicated that the surge in remote GP appointments observed during lockdown could translate to a longer-term shift away from face-to-face consultations. The questionnaire, found 95% of GP respondents were providing remote consultations, with 88% wanting greater use of remote consultations to continue in future.

In practice, it is widespread access to *superfast* broadband, rather than standard broadband, that will be key to unlocking these externality benefits:

- Superfast broadband (SFBB) should provide households with sufficient bandwidth for the vast majority of online activities including the more data-hungry and symmetric applications that have seen increased usage during lockdown, including video-conferencing.
- This contrasts with standard broadband (SBB), delivered via ADSL technology, which is much more constrained in terms of the activities it can support due to lower bandwidth, particularly for multi-user households

While to date the focus of consumer's purchasing decisions to date has been download speed for content consumption, the move to increased communications such as video calling has emphasised the importance of upload speeds. For example, Zoom video-calling and group video requires broadly symmetric bandwidth, with 600 KBit/s symmetric bandwidth required for a basic (720p) video call with 3 Mbit/s symmetric bandwidth required for a full HD group video.[107]

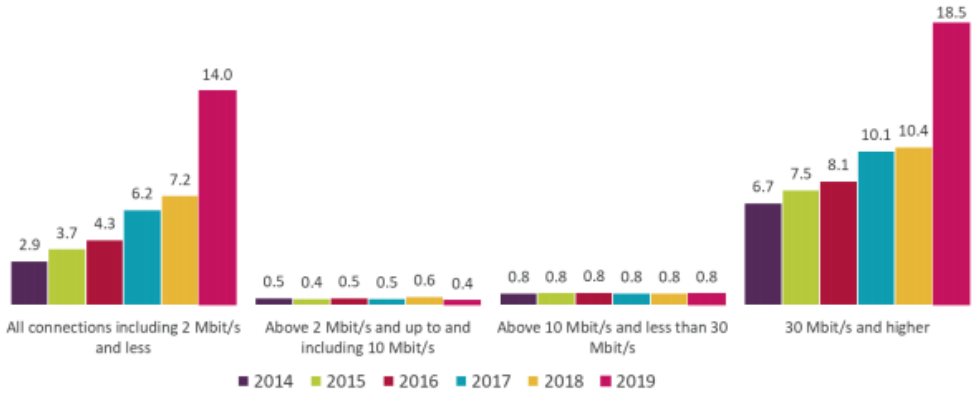
Recent Ofcom data below shows that mean upload speeds are an order of magnitude greater for SFBB (> 30 MBit/s download) than SBB:

[105] https://news.sky.com/story/coronavirus-almost-one-in-three-workers-ready-to-keep-working-from-home-after-lockdown-12025311

[106] https://www.cityam.com/majority-of-firms-to-expand-remote-working-policies-in-wake-of-coronavirus-pandemic/

[107] https://support.zoom.us/hc/en-us/articles/201362023-System-requirements-for-Windows-macOS-and-Linux

Figure 18 Average UK fixed broadband upload speeds (Mbit/s): 2014 to 2019



Source: Ofcom, using data provided by SamKnows; see note [10] in the Sources section.

Source: Ofcom UK Home Broadband Performance TECHNICAL REPORT: Publication date: 13 May 2020. Figure 25

As such SBB at best only supports basic functionality for a single user video calling/conferencing while SFBB will support a full range of functionality for multiple users. Even before this change in consumption Ofcom noted in its 2017 WLA consultation:

"*Many households' broadband use requires SFBB, especially those using multiple broadband based services at the same time, those using services needing high bandwidths, and households whose SBB speed is low. As demand for bandwidth continues to grow, the number of households requiring SFBB will rise further*."[108]

It is therefore important that Ofcom considers the externality benefits of high SFBB broadband penetration, which as explained below, could be undermined by allowing access prices to rise significantly above cost.

5.6.3 Higher wholesale charges could undermine migration to SFBB

The UK already benefits from widespread availability of superfast broadband (SFBB, defined by Ofcom as offering speeds in excess of 30Mbit/s), with coverage of around 95%[109] and a range of ongoing initiatives to expand coverage to the final 5% e.g. the BDUK subsidy scheme and the Universal Service Obligation. However, whilst SFBB is widely available (and has been for several years), a third of households still use SBB.[110] This implies that there are significant static benefits (including the externality benefits mentioned above as well as private consumer benefits) that could be unlocked by ensuring timely transition from SBB to SFBB:

[108] Ofcom 2017, WLA Market Review Consultation: Volume 1, para. 3.45, page 37

[109] Ofcom - Connected Nations Update: Summer 2020

[110] Ofcom 2020, WFTMR Market Review Consultation: Volume 2. Para. 2.70, page 31

Allowing FTTC 40/10 charges to rise in line with inflation risks slowing the migration of customers from standard to superfast broadband services (and from lower to higher bandwidth SFBB), by pushing up the retail prices of SFBB products.

Some households (in particular, those with lower incomes) that already subscribe to SFBB could also be incentivised to downgrade (either to a lower speed SFBB service or to SBB) or to find lower quality/price alternatives e.g. relying exclusively on their smartphone to access online services.

The COVD-19 crisis is likely to amplify the potential welfare losses associated with reduced take-up of SFBB due to:

- The slowdown in economic activity putting greater pressure on households' incomes which will in turn mean take-up is more sensitive to changes in price;
- The increased importance to the wider economy of widespread access to/ take-up of high speed broadband services.

Further, whilst there is evidence that a significant portion of subscribers that are still on SBB are disinclined to upgrade because they do not value faster speeds[111], this could change as a result of the COVID-19 crisis, as people become more reliant on/ aware of the benefits of faster speeds, with affordability instead becoming the more important barrier to these consumers upgrading.

It is also important to consider the potential distributional impacts of higher broadband prices – Ofcom data indicates that households in lower socio-economic brackets (in particular DE) are less likely to have access to a superfast broadband connection and are also most likely to be facing affordability issues with their telecoms services.[112] The impact of higher prices on broadband take-up is likely to be particularly strongly felt by lower income households. The fact that these households will also be amongst the most exposed to the impacts of an economic downturn will exacerbate these distributional impacts.

5.6.4 COVID-19 likely increases the social cost from slower migration to SFBB relative to uncertain and longer-term benefits from faster FTTP roll-out.

In summary, we find:

- The crisis amplifies the potential welfare losses from Ofcom's proposals to allow wholesale FTTC 40/10 charges to rise in line with inflation – the prospect of high unemployment exacerbates the risk that Ofcom's proposed approach will reduce (or at least slow down) the transition to SFBB services at a time when widespread access to decent broadband is particularly important.
- Further, the above consumer welfare losses would be felt in the near-term and are more concrete/ tangible than the hypothesized dynamic benefits of higher wholesale FTTC charges: as explained in the preceding sections, Ofcom has not convincingly demonstrated that its proposed approach will have a material impact on altnets' incentives to invest in full fibre. Further, the benefits of any

[111] Ofcom 2020 WFTMR, Volume 4, paras 2.53 - .54.

[112] Ofcom 2019, Access and Inclusion in 2018: Consumers' experiences in communications markets, pages 9-10

incremental investment in full fibre are more aspirational, uncertain and longer-term.

- Therefore, in light of this change in circumstances, the societal value of ensuring consumers have access to affordable SFBB broadband has increased, to support a timely transition from SBB to SFBB over the next five years.

ANNEX A REVIEW OF 2019 AND 2020 RFS

A.1 Profitability of BT's regulated business to date

To support compliance with remedies imposed in markets where Ofcom has determined BT to have SMP, Ofcom requires BT to produce Regulatory Financial Statements (RFS) for SMP markets and sets out publication requirements for a subset of the documents. The RFS are presented on a Current Cost Accounting basis (CCA), where assets are revalued each year to reflect changes in purchasing power and hence the replacement costs of assets.

The published RFS also allow stakeholders to monitor the effectiveness of regulation. For instance, if revenues far exceed costs, including the cost of capital, in a market where SMP has been found and regulation has been imposed, it could be indicative of issues with the effectiveness of the regulatory remedy that Ofcom has selected.

The costs referred to above include the regulated Weighted Average Cost of Capital (WACC). Periodically Ofcom determines the appropriate (regulated) cost of capital for given charge controls[113]. This cost of capital therefore provides a benchmark of the return that BT's shareholders require to invest in the regulated business. In general, charge controls are set such that over time, prices are expected to converge to costs; this is equivalent in general to the Return on Average Capital Employed (ROACE) being equal to the determined (regulated) cost of capital.

In this annex, we provide an update on BT's profitability to date, building on our estimates in previous reports.

A.1.1 Adjusting for the FTTP investments

One of the SMP markets is the WLA market, which comprises both FTTC and FTTP businesses. The FTTP business is nascent, which means that it is naturally loss-making due to the lack of economies of scale. In turn, this means that taking the figures for the WLA market at face value will incorporate the loss-making FTTP component, which may mask the profitability of legacy services (which have been charge-controlled by Ofcom).

The 2019 and 2020 RFS contains detailed information on the costs and capital employed associated with FTTP, which allows us to make the necessary FTTP adjustments for 2018, 2019, and 2020.[114]

[113] Compared to utilities, where the regulator both determines the level of investment but also provides a commitment that the operator will recover the investment, Ofcom sets a higher cost of capital. See for example http://www.ukrn.org.uk/wp-content/uploads/2018/06/2018-UKRN-Annual-WACC-Summary-Update-v2.pdf

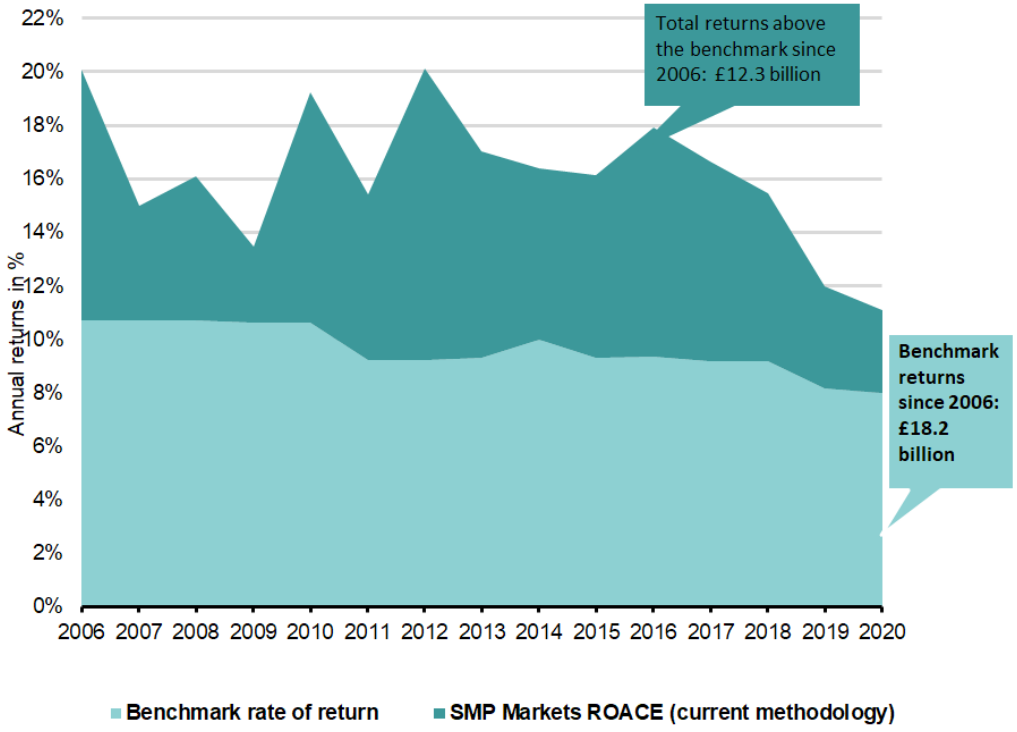
[114] We are unable to make this adjustment for years prior to 2018 as older RFS did not contain sufficiently granular information to make the FTTP adjustment. However, we expect that the fraction of WLA costs attributable to FTTP is likely to be smaller prior to 2018, and even if this fraction is still significant, it would only make our results more conservative, as we would be understating the returns from FTTC if we do not make the FTTP adjustments.

This allows us to adjust the WLA market figures by subtracting the FTTP costs and capital employed to obtain an estimate of the FTTC figures.[115] To adjust for FTTP revenues, we use figures from the latest available financial results.[116]

A.1.2 Overall profitability

As can be seen in the figure below, the overall level of profitability has remained significantly above the determined cost of capital throughout the period. While in the first part of the period this was in large part due to charge controls not adequately constraining BT's prices to costs, in recent years Ofcom's charge controls have more effectively constrained regulated prices to cost. Accordingly, we observe quite high levels of excess profits prior to 2018, but since 2018, the amount of excess profits has declined. However, despite the decline, the quantum of excess profits remain substantial.

Figure 19 BT Total regulated Profitability



Source: *Frontier analysis of BT RFS*

Note: *Historic data adjusted for changes in methodology*

A.1.3 Profitability by market

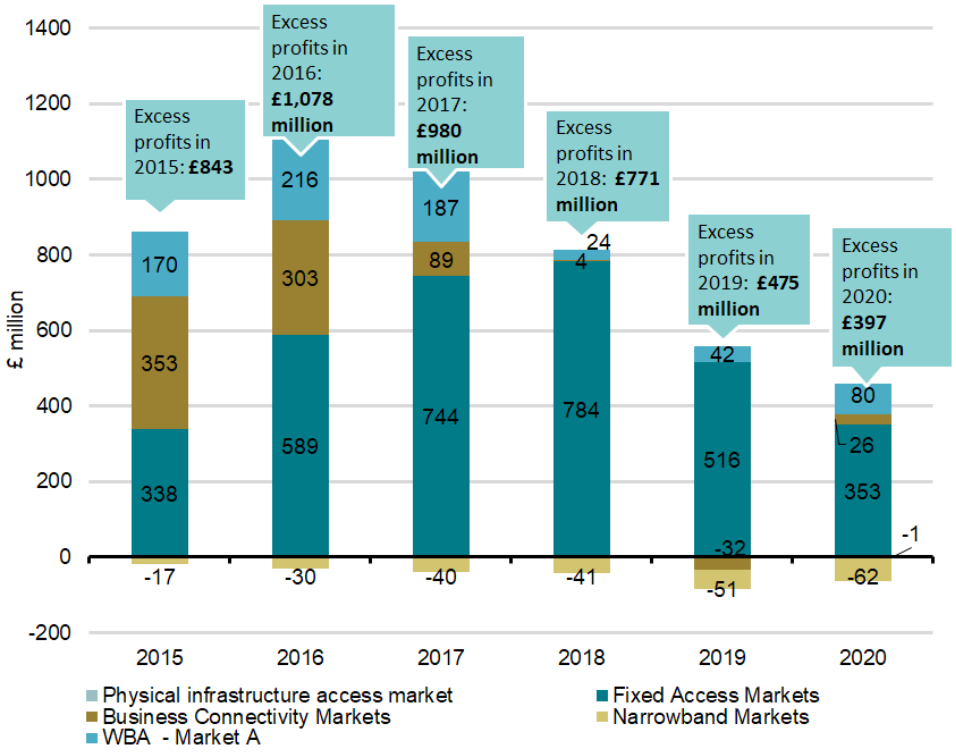
As can be seen below, when considering profitability by market, excess profits reported in the Business Connectivity Market, which underlies services to large corporate customers and provides capacity for other network operators, have

[115] The specific line items used for the adjusted related to "FTTP Development", "GEA FTTP Repairs", "GEA FTTP Provisions", "FTTP Funded Fibre Rollout Spend", "FTTP Fibre Rollout Funding", "GEA FTTP Electronics", "GEA FTTP Customer Site Installation", "GEA FTTP Access Fibre Spine", and "GEA FTTP Distribution Fibre Spine".

[116] 4Q FY2019/2020 at the time of writing, available at https://www.bt.com/about/investors/financial-reporting-and-news/results-events-and-financial-calendar/2019-20#tab-19-20-accordion-1

dropped considerably since the last charge control was introduced in 2017. Profits in the WBA market A have also shown a significant dip since 2018.

Figure 20 Profitability by market



Source: *Frontier analysis of BT RFS*

Note: *Physical infrastructure access market is a new market introduced in the 2020 RFS. The excess returns are 0 in 2019 (not pictured in chart) and -£1m in 2020*

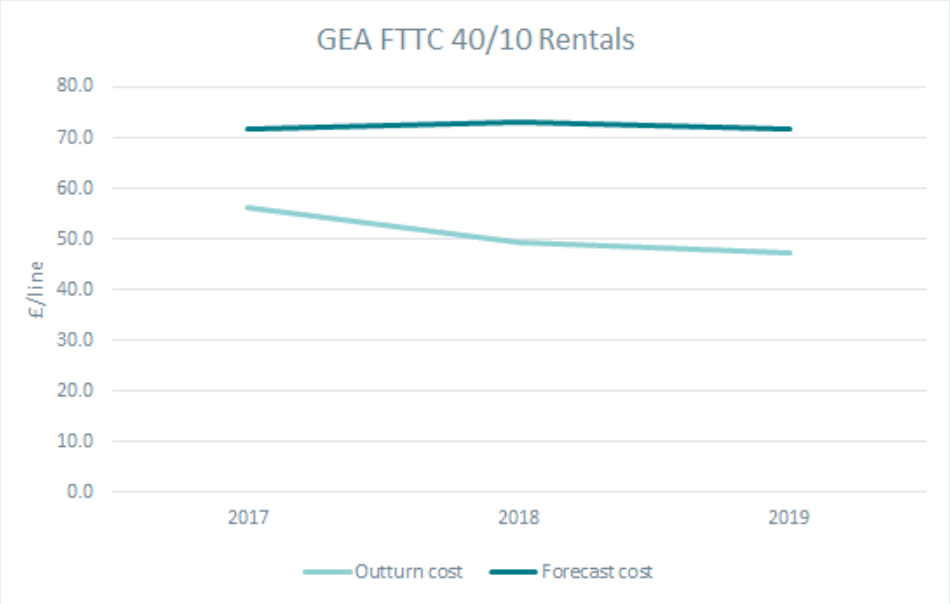
The majority of recent excess profits are generated by the Fixed Access Markets, which relate to the provision of mass market broadband and voice services. This suggests that Ofcom's charge control has been more successful at moving prices towards costs. However, prices continue to remain above cost, as evidenced by significant excess profits even in 2020.

A.1.4 FTTC profitability

One reason for the current excess returns observed in the Fixed Access Markets is that the actual costs incurred remain lower than Ofcom's forecast costs used to set the FTTC charge control. Since 2018, the outturn costs for the FTTC 40/20 product have been at least 22% lower than the forecast costs.[117]

[117] There is insufficient detail in the RFS to do this analysis for 2017.

Figure 21 FTTC – comparing forecast and outturn costs



Source: Frontier analysis of BT's RFS and the 2018 WLA model

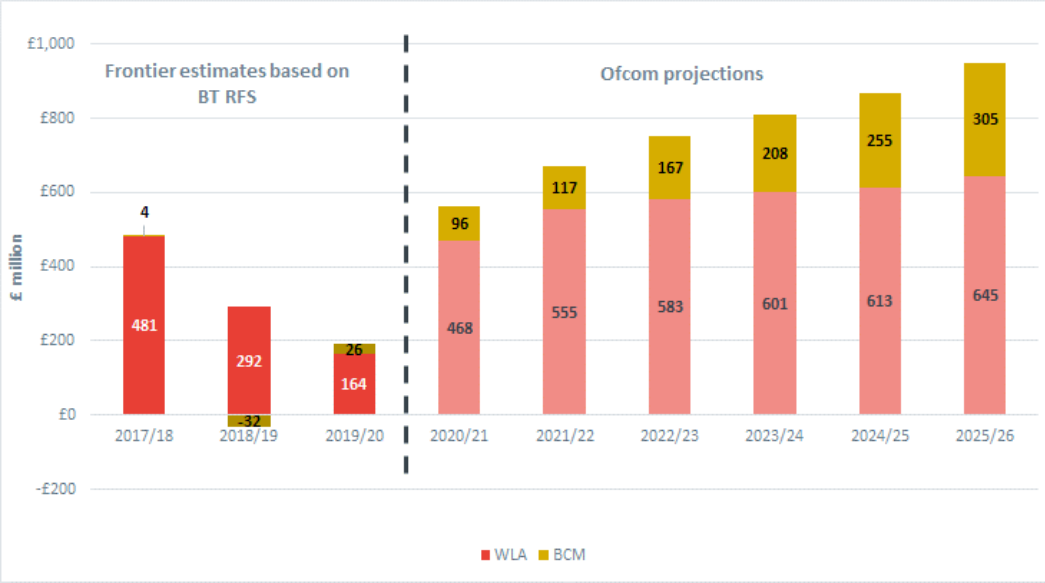
With FTTC prices already being above cost, Ofcom allowing prices to increase in line with inflation will only increase this gap between prices and costs as Ofcom expects FTTC costs to fall over time. This means that excess returns (which are still substantial) will also increase over time.

A.1.5 Projecting Openreach's profitability based on Ofcom's current proposals

The chart below focus on the profitability of the WLA and Business Connectivity markets over time, where the estimates till 2019/20 are based on our analysis of BT's RFS and those after 2020/21 are based on Ofcom's own estimates of profitability based on its current proposals.

As can be seen below, there will be a substantial increase in excess profits following the implementation of Ofcom's current proposals. This increase comes on top-of already significant excess returns, particularly in the WLA market, even when Ofcom was attempting to set prices at cost.

Figure 22 Projecting Openreach's profitability under Ofcom's current proposals



Source: For 2017/18-2019/20 – Frontier estimates based on BT RFS; from 2020/21 onwards, Frontier estimates based on Ofcom's projections in Access Review CPI-X Model or Cost modelling for active services, and Table A16.7 in January 2020 WFTMR: Annexes 1-23 of 24

ANNEX B NETWORK ROLLOUT ANNOUNCEMENTS DO NOT INDICATE THAT A 'PRICE CONTINUITY' APPROACH IS REQUIRED TO SUPPORT INVESTMENT

B.1 There is no clear link between the timing of operator announcements and the publication of key Ofcom policy documents

Ofcom's assertion that its strategy has been effective, even before being implemented relies on a supposed correlation between the timing of its public announcements and operator's announcements of plans for investment.

Even setting aside the fact that operator announcements do not necessarily equate to actual investment, looking at the timing and broader context of key announcements by alternative networks there does not seem to be any clear correlation/ link with statements made by Ofcom relating to SFBB access regulation– in particular, its March 2017 proposal to introduce a charge control for FTTC products or its announcement in July 2018:

1. The announcement (in March 2017) and implementation of (in March 2018) plans to introduce a cost-based charge control for wholesale FTTC products does not appear to have resulted in any scaling back of announced plans or rollouts that were already underway. This is despite the fact that the charge control resulted in a substantial reduction in the GEA 40/10 price of around 30% (£28.90 per subscriber per year). [118]
2. Many of the ambitious targets for altnet rollout appear to have been set in the months following the March 2017 announcement from Ofcom.
3. Ofcom's signalling of its intent to allow wholesale FTTC charges to rise in line with inflation (in July 2018) does not appear to have resulted in any marked acceleration/ expansion of altnets' rollout plans.

Whilst there are examples of some altnets securing financing in the period following the July 2018 policy document, this appears to have broadly been to fund pre-existing plans. Furthermore, rollout financing deals also appear to be a continuation of a trend of banks showing greater willingness to invest in fibre infrastructure, that has been emerging over a number of years, rather than a step change triggered by Ofcom's shift in regulatory strategy. Indeed, a survey of investors' views on fibre investment (which pre-dated the aforementioned policy document), conducted for DCMS in the early part of 2018, found that most of the people interviewed had *"observed a change in attitude towards investments in telecoms infrastructure (particularly fibre networks) in the UK in recent years, as*

[118] Ofcom 2018, WLA Market Review Statement, Volume 2, Table 1.1

investors are starting to become more comfortable with the risks… and evidence demonstrating the viability of privately funded fibre projects has started to emerge"[119]

B.2 Actual rollout to date by altnets has been limited

Ofcom's argument that its strategy appears to be having an effect is undermined by the fact that, whilst there have been some ambitious announcements from altnets, actual rollout to date is fairly minimal (Virgin Media aside):

- **CityFibre** has thus far only deployed to around 300,000 of its planned 8 million premises (including the 3m planned by FibreNation, which it recently acquired).
- As of October 2019, **Hyperoptic** had passed 400,000 of the 5 million premises it aims to cover by the end of 2024.
- As of April 2020, **Gigaclear** had rolled out to 129,000 of the 500,000 premises it aims to cover by 2025.

Further whilst some fairly substantial sums of money have been 'earmarked' for altnet rollouts – in particular, £2.5 billion for CityFibre – this investment does not appear to have been committed (and if it had then Ofcom's decision on the charge control would not influence the level of build).

The only major (non-BT) network rollout that is at a relatively advanced stage – Virgin Media's Project Lightning – was announced in January 2015, before Ofcom's current strategy was announced. Here the key driver of the business case appears to have been the ability of cable/ fibre to offer higher bandwidths than BT's copper network - Tom Mockridge, Virgin Media Chief Executive Officer, noted at the time:

"*In virtually all of the areas we have identified for expansion, BT is the only option available right now. Its ageing copper telephony wires are not capable of the ultrafast connectivity that Virgin Media delivers. Soon we will offer unbeatable services to even more homes and businesses across the country*."[120]

The introduction of a charge control for FTTC services, in March 2018, does not appear to have negatively impacted on its rollout plans. By the end of 2018, Virgin Media had built out to 1.6m premises[121] and its owner, Liberty Global noted in its Q1 2019 results: "*We continue to extend our reach with Project Lightning, where we are building 400,000-500,000 new premises every year*." Project Lightning coverage has since increased to 2.2m premises.[122] Similarly, Ofcom's July 2018 announcement that it was minded to allow regulated FTTC charges to rise in line with inflation does not seem to have triggered a ramping up of its rollout rate, as illustrated by the figure below which shows the evolution of Virgin Media's footprint over the period 17 – Q1 2020.

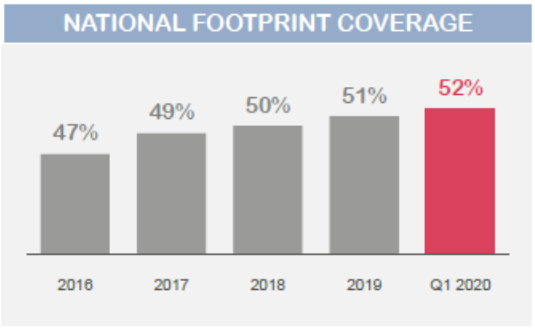
[119] Frontier Economics 2018, Future Telecoms Infrastructure Review: Annex A, page 26

[120] https://www.ispreview.co.uk/index.php/2015/02/virgin-media-expand-uk-cable-broadband-network-17-million-premises-2020.html

[121] Liberty Global (2019), Q4 2018 Fixed Income Release, page 2

[122] https://www.libertyglobal.com/wp-content/uploads/2020/05/Liberty-Global-Q1-2020-Investor-Call-Presentation.pdf

Figure 23 Virgin Media National Footprint – 2016 – Q1 2020



Source: Liberty Global plc Q1 2020 Investor Call Presentation, slide 17

B.3 Operator announcements do not equate to actual build

Whilst some ambitious plans have been announced by certain operators and substantial sums of money have been 'earmarked' for investment in fibre, it is important to note that investments are not actually committed (or 'sunk') until the infrastructure build has been contracted. In addition, funding for major network investment projects of this nature is not (typically) made available as one large lump sum but deployed in tranches, with the release of each tranche being contingent on a number of factors including whether certain pre-agreed targets have been met e.g. in relation to take-up and number of premises passed. As such, operator announcements actually provide fairly limited insight into i) the actual level of competitive fibre build that can be expected in the coming years and ii) the extent to which Ofcom's regulatory strategy (or indeed the host of other factors affecting the business case for fibre rollout) can be said to be supporting fibre build.[123]

It should also be noted that some network operators and investors in fixed networks (including both BT and altnets) have strong incentives to signal (for example through investors reports or responses to Ofcom consultations) that allowing Openreach to set higher access charges is important for the altnet fibre business case, if they expect that this will increase their returns (even if only by a relatively modest amount), regardless of whether it is actually necessary to support rollout as the cost of making such statements is negligible. As such, Ofcom's observation that "*Investor reports have demonstrated how these pricing signals contribute to investor confidence*"[124] also provides limited insight into the link between either its historical or proposed strategy and rollout.

[123] For example, BT announced in 2009 plans to roll out FTTP networks to approximately 10% of UK households by 2012. See https://www.ofcom.org.uk/__data/assets/pdf_file/0025/37555/fttpcondoc.pdf

[124] Ofcom WFTMR, Volume 4, para. 1.18

ANNEX C CRITIQUE OF OFCOM'S COST MODELLING APPROACH FOR AREA 2

C.1 Ofcom's cost modelling is inconsistent with how it has previously approached charge controls in a period of technological change

C.1.1 Ofcom has not addressed the significant challenges associated with forecasting roll-out and take-up of a new technology

To estimate charges under a scenario consistent with a cost based charge control, Ofcom has mechanistically updated the cost model used for the previous charge control for WLA in 2018 (and the modelling used for the BCMR in 2019 although this was not used to set the charge control) without reflecting the changes that would be needed to set efficient charges on a forward-looking basis.

In particular, Ofcom does not appear to have considered how it would best address the fact that a charge control would be in place during what will be a period of substantial technological change, as Openreach ramps up its deployment of FTTP services. Setting charge controls for legacy technologies during such a period can be challenging, since there will be significant uncertainty around the roll-out and take-up of new technologies and in turn the implications for the efficient level of prices taking account of allocative, productive and dynamic efficiencies.

The need to achieve such a balance was recognised in the 2013 EC recommendation on Next Generation Access (NGA) costing methodologies[125], with recital 25 stating:

> *"A costing methodology that leads to access prices replicating as much as possible those expected in an effectively competitive market is appropriate to meet the objectives of the Regulatory Framework. Such a costing methodology should be based on a modern efficient network, reflect the need for stable and predictable wholesale copper access prices over time, which avoid significant fluctuations and shocks, in order to provide a clear framework for investment and be capable of generating cost-oriented wholesale copper access prices serving as an anchor for NGA services, and deal appropriately and consistently with the impact of declining volumes caused by the transition from copper to NGA networks, i**.e. avoiding an artificial increase in wholesale copper access prices which would otherwise be observed as a result of customers***

[125] 2013/466/EU: Commission Recommendation of 11 September 2013 on consistent non-discrimination obligations and costing methodologies to promote competition and enhance the broadband investment environment

> ***migrating to the NGA network of the SMP operator."***
> *[emphasis added]*

In recent market reviews Ofcom has addressed similar issues by applying an 'anchor pricing' approach, whereby prices are set on the basis of a 'hypothetical ongoing legacy network' essentially 'as if' the new technology was not rolled out. This is based around the principle that this approach provides appropriate signals to ensure productive and dynamic efficiency while ensuring customers using legacy technologies are not made worse off by the adoption of new technology – Ofcom noted in 2012, in the context of the regulation of legacy copper services during the rollout of FTTC, that:

> *"The anchor pricing approach is intended to give the regulated firm incentives to invest in new technology only when providing services over the new technology would lower its overall costs and/or would enable it to provide higher quality services for which consumers are willing to pay a premium. At the same time, consumers of existing services are not made worse off by the adoption of new technology."*[126]

Ofcom further noted that following an anchor pricing approach "*would not allow prices to rise above the level implied by the hypothetical continuation of the existing technology, and thus seek to prevent the introduction of new technology leading to price increases for services which can be provided on the basis of the current technology*."[127]

An anchor pricing approach is focussed on the investment decisions made by the regulated operator, i.e. Openreach, in the absence of competition. While this may be a reasonable approach in Area 3, where Openreach is expected to maintain its dominance, this may not send the correct build or buy decisions where the market is expected to be contestable.

An alternative approach that Ofcom has applied where the market is considered contestable (and also considered as an alternative to anchor pricing in previous market reviews) is to set prices with reference to a Modern Equivalent Asset (MEA) – that is, the most efficient technology available to serve forward-looking demand, which would be FTTP in this case. This is the approach set out in the 2013 EC Recommendation. Under this approach the costs of an FTTP network would be used to determine the cost of delivering copper/ FTTC services, but 'abated' to account for the fact that they provide lower functionality and have higher operating costs. The prices under an MEA approach would be, by definition, lower than those under a hypothetical ongoing network approach (as the MEA is by definition more efficient, adjusting for differences in functionality).

However, when estimating Openreach's over-recovery under a cost-based scenario Ofcom has applied neither an anchor pricing/ hypothetical on-going network approach nor an MEA approach. Instead it appears to essentially have modelled the copper/ FTTC legacy network based on BT's historical costs but adjusting for the migration away from copper/ FTTC services to fibre over the five-year review period, based on its projections of take-up of FTTP services offered by

[126] Ofcom 2014 FAMR Statement, Volume 2, para. 3.51

[127] Ibid, para. 3.59

BT and altnets which, by Ofcom's own admission are subject to considerable uncertainty.

C.1.2 The significant uncertainty associated with COVID-19 increases the uncertainty attached to Ofcom's approach

The COVD-19 crisis means that there is heightened uncertainty around the future dynamics of the UK broadband market and in particular, the rate of rollout and transition from to higher bandwidth services rolled out over FTTP:

- The slowdown in economic activity is putting greater pressure on households' incomes which will in turn impact the extent to which they are willing to pay more for faster broadband services – this in turn creates uncertainty around the rate of transition from copper/ADSL to FTTC and to full fibre. This would be exacerbated by the approach to modelling cost-based prices that Ofcom has adopted in the WFTMR consultation document, whereby the unit cost of FTTC-based services is assumed to rise as volumes fall, which would in turn undermine the transition from SBB to SFBB services.
- The crisis may affect operators' appetite and ability to roll out fibre services, which further increases the uncertainty around the rate at which customers can be expected to migrate from Openreach's legacy network to FTTP.

Ofcom's approach, which attempts to forecast actual rollout and migration to FTTP is subject to this uncertainty. The alternative approaches – anchor pricing or MEA, are not dependent on actual rollout and as such are more robust.

C.2 Ofcom's migration forecasts in its cost modelling are not well founded

As noted above, Ofcom has previously adopted an anchor pricing approach in periods of migration between platforms. Under an anchor pricing approach there is no need to make explicit forecasts of the rate of migration as the cost base assumes a hypothetical ongoing network.

In its calculations of the 'overcharge' Ofcom has used a cost model which attempts to model costs of the copper platform as customers migrate to FTTP (both Openreach and altnet). Even if this approach were appropriate, the forecasts assume a far higher rate of migration away from the Openreach copper network than plausible.

C.2.1 Ofcom's volume assumptions are unrealistic

Ofcom's cost modelling is based on the assumption that altnets' customer numbers will increase from 6 million to 10 million in the forecast period[128], which appears to implicitly assume a level of further altnet rollout of at least the magnitude assumed by Ofcom to be the result of its proposal. For example, if the altnet uptake of premises passed remains at 40% (roughly the level achieved by Virgin Media), then an increase in altnet take-up of 4 million in turn implies 10 million additional premises passed by alternative operators. In reality, uptake is likely to be lower than 40% on average as it will require some time for altnets to build up their

[128] A16.76

customer base and in some cases altnets will be competing for customers with both Openreach and one or more other operator (rather than Virgin Media who currently only compete with Openreach in most areas).

As a result of this unrealistic forecast of additional altnet roll, Openreach's subscriber numbers are forecast to fall, despite increases in overall fixed line demand. As there are significant economies of scale in fixed access networks, a lower subscriber base will, all else being equal, lead to increased average unit costs.

The volume assumptions are also internally inconsistent with Ofcom's rationale for a CPI-0 cap

Ofcom seems to consider that CPI-0 is *necessary* to support altnet rollout and this in turn will incentivise Openreach rollout in Area 2. Ofcom also considers the higher prices are a quid pro quo for Openreach to commit to roll out to 3.2 million premises in Area 3.

Conversely, Ofcom must believe that in a scenario where cost-based charge controls are implemented, the level of altnet rollout will be far lower than under Ofcom's proposals. However, Ofcom is forecasting a very significant rollout in this scenario, which appears inconsistent.

Put another way, if a rollout of 10 million additional altnet premises is Ofcom's forecast under a cost based charge control, it is difficult to see what benefit would be derived from setting the charge control at a higher level. If Ofcom had used forecasts which were internally consistent with its own assumption that significant altnet rollout would not occur under a cost-based charge control, then the forecast growth in altnet subscribers would be much lower, the Openreach subscribers higher and hence the forecast unit cost lower.

C.2.2 Ofcom's assumptions on BT fibre rollout also appear inconsistent with a view that higher prices are required for BT investment.

Given that the threat of rollout by altnets is assumed by Ofcom to drive Openreach's FTTP rollout in Area 2 and a CPI-0 charge control Openreach's commitment to rollout to 3.2 million premises in Area 3, we would also expect Ofcom to assume much lower Openreach FTTP rollout under a cost-based charge control scenario. It is not clear from Ofcom's description that such downward adjustments have been made, but the estimate of Openreach FTTP subscribers under cost-oriented charge controls appear to assume a high level of rollout. A lower estimate of FTTP rollout would lead to higher volume forecasts for copper-based services and hence lower forecast average costs for legacy services due to economies of scale.

C.2.3 Ofcom should take account of elasticity effects from lower prices

A final adjustment that should be made is the direct effect of lower prices under a cost-based charge control, due to both demand elasticity and greater

competitiveness of Openreach services compared to rivals. This will be the case both for WLA services and potentially to a greater extent BCM services. For BCM services current prices of very high bandwidth services are considerably above costs and Ofcom has based its volume forecasts on Openreach estimates which presumably assume these prices being maintained.

C.2.4 Overall Ofcom should adjust copper volumes upwards, increasing scale economies

Correcting for these clear inconsistencies would lead to higher volumes of legacy services. Given there are significant economies of scale, this would reduce the unit cost of these services.

C.3 Ofcom's uplift for 'stranded assets' is not justified

Ofcom has introduced an ad hoc adjustment which recovers forecast copper cable capital expenditure for the period from 2018/19 to 2025/26 from copper customers over the period 2021/22 to 2025/26.

Such an adjustment is not necessary under an anchor pricing approach as the network is assumed to continue to operate into the foreseeable future. Even if Ofcom were to depart from an anchor pricing approach when setting a (hypothetical) charge control, Ofcom would need to consider the appropriateness of such an ad hoc adjustment.

Ofcom's rationale is:

> *"there is a possibility not all capital expenditure spent on copper assets will be able to be recovered through depreciating assets over there [sic] useful lives (this is commonly referred to as 'asset stranding'). We believe that it is appropriate and in line with our objectives to give Openreach the opportunity to recover these efficiently incurred costs."*[129]

This proposal raises a number of questions:

1. Is it efficient to recover the value of assets that may become redundant before they are fully depreciated from a period when they are being used to deliver services;
2. If yes, is the group of customers from which these costs are being recovered appropriate; and
3. Is Ofcom's estimation of the required level of early recovery accurate.

C.3.1 In Area 2, the high cost of maintaining the copper network over its remaining life should be compensated by a reduction in the asset value

In Area 2, there is a material degree of competition from Virgin Media and the prospect of competitive entry from altnets.

It is clear that the widespread availability of fibre networks due to the reduction in the cost of rolling out fibre networks has led copper networks to become obsolete.

[129] A16.124

One of the reasons for this obsolescence, is the need for constant maintenance of the copper cable which is the source of any forward looking capital expenditure (with demand on the copper network falling the capital expenditure is not driven by capacity expansion).

When determining charge controls previously on a national basis Ofcom has set prices on a CCA-FAC basis as a proxy for the competitive level of prices, given the market has been considered contestable. As the copper network is now becoming obsolete, the competitive level of prices for services offered over that network must, if anything, be lower than before. It would be perverse if, at the point where copper assets are obsolete, regulated prices for services delivered over these assets to be increased. As Ofcom itself recognises, its policy is of incentivising BT to invest in FTTP in Area 2 is largely driven by the threat of altnet investment – there should therefore also be no expectation of an adverse effect on BT/OR's incentives to invest from any possible copper asset stranding.

Under a MEA approach the obsolescence of the copper network would be reflected as a change in the CCA asset value of the copper assets. To the extent to which future expenditure was necessary to maintain the network which could not be fully recovered through a depreciation charge, this should be reflected in an offsetting reduction to the asset value, rather than feeding though into higher prices. As such an upwards adjustment to cost is not justified.

C.3.2 The magnitude of the 'stranding' is over-estimated

The forecast level of copper capital expenditure incurred by Openreach is likely to be over-estimated for two reasons:

- The base year capital expenditure was likely inflated due to the need to compensate for the under-investment in the copper network during the early part of the last decade; and
- The methodology to project from this base level is based on the relationship between expenditure and volumes in a steady state, not the minimum level of expenditure required to maintain the quality of services for an obsolete network.

From 2009 BT restricted capital expenditure in the copper access network below that required to maintain the network in a steady state which led to reduced Quality of Service. As Ofcom introduced QoS regulation in 2014 which was extended in 2018, the level of copper capital expenditure has increased and is likely to include additional expenditure above that required to maintain a steady state to address the deficit in previous years.

Ofcom has used the same projection method for capital expenditure as used in its costs model generally, which estimated the efficient level of expenditure for an ongoing network. However, in view of the impending copper switch off, this would clearly be an upper bound for the efficient level of expenditure to maintain quality of service for a network with limited remaining life. There are likely to be significant efficiencies available in using alternative engineering rules to maintain the network taking account of the expected operating life of copper cables for example:

- As customers migrate to full fibre networks, there will be an increasing number of 'spare pairs' on cables which could be used to substitute for faulty active pairs without additional capital expenditure; and

- There will be scope for short term repairs to cables which would have been inefficient in the long run previously (e.g. over the 20-year life of a cable) but which are the efficient approach when the cable only has a remaining operating life of 10 years.

C.3.3 Ofcom's approach to recovery of the (unjustified) uplift is arbitrary

Ofcom spreads the cost over the five-year charge control period, a period which does not match with the period over which the capital expenditure is assessed. The methodology used to spread the cost over the five-year period is unclear. The introduction of an increased cost in the first year of the market review period leads to a 'cliff edge' where costs are significantly higher in this year than the previous year. This clearly does not reflect the competitive level of prices.

In terms of the customers who bear the cost Ofcom's approach is somewhat convoluted in that the costs are first allocated to copper lines (MPF and WLR) but then the unit cost of these lines is capped and the excess costs above this cap is allocated to FTTC services. This effectively reallocates the costs allocated to MPF lines to FTTC services. There appears little logic to this final allocation with some subscribers, whose services are delivered over MPF alone, paying nothing due to the cap on MPF services, customers of WLR services paying a proportion up to a cap and customers taking FTTC services paying a further premium.

C.3.4 Conclusion on the adjustment for copper asset 'stranding'

In conclusion, Ofcom's approach of applying an uplift to take account of assets that may be stranded is not economically justified, and, given the expectation of the retirement of the copper network, the efficient level of forward looking capital expenditure will be less than that projected by Ofcom in its calculations. Furthermore, the approach used to allocate this uplift between groups of customers does not appear to have any justification.

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