Wholesale Local Access Market Review: further submission on Ofcom's assessment of the 'fair bet'

This further submission presents evidence to show:

- BT did not expect payback on FTTC investments during this charge control period.
- The risks faced ahead of investment were significant; the possibility of upside outcomes was necessary to support investment.
- Oxera's estimate of the three parameters required to consider the fair bet is reasonable, based on the contemporaneous evidence available.

Alongside this submission, we attach a second report from Oxera ('Oxera 2'). This assesses the financial analysis carried out by BT in June 2008 which showed the sensitivity of project returns to a number of risky variables.

Oxera finds that capping returns below a critical level of 14.8% would likely be inconsistent with the fair bet principle, since it would result in an expected return, at project inception, of less than 12.8% (the high-end of Oxera's estimated the cost of capital range considered to be more representative of the risk profile of BT's FTTC investment).

The analysis considers the impact of one parameter (the Openreach pricing premium) on the Group returns as the latter is particularly sensitive to variations in the premium. Oxera note that introducing the impact of other key parameters, such as the retail level pricing premium and the take-up rates, would increase the critical level of capped returns even further.

We would happy to discuss any aspects of this further submission with Ofcom.

Openreach

18 October 2017

Introduction and summary of our position

1. Ofcom's March 2017 Wholesale Local Access market review consultation (the "March WLA consultation") proposed significant reductions to the price of certain Openreach superfast fibre access services from April 2018. In our response to the March WLA consultation, we set out our concern that, among other things, the proposed price cut would be inconsistent with the fair bet principle.

2. We began investing in next generation access (NGA) superfast broadband services in 2008/9. The decision to invest was taken in the face of a number of uncertainties, and projections of long term returns on the investments were, therefore, risky. The decision to invest reflected perceptions about the balance of downside and upside risks faced.

3. We believe it is common ground between Ofcom and BT that the fair bet principle means that any regulatory intervention after an investment is made should not constrain returns in a way that would retrospectively undermine the basis for the investment decision. We note, in particular, Ofcom's statements in the March WLA Consultation that "… the investing firm needs to benefit from sufficient upside potential from any investment to offset the downside risk of failure."[1]

4. Ofcom's base case proposal is to reduce the price of 40/10 GEA rentals by just under 40% during this review period. Our concern is that such cuts would truncate the overall level of returns we can make on these investments to a level where we would not, in fact, be allowed to benefit from a ***sufficient*** level of "upside potential" – i.e. sufficient to provide the balance identified by Ofcom as necessary to offset risks faced at the outset of the project.

5. The report by Oxera provided with our response to the March WLA Consultation ("Oxera 1") set out a methodology for assessing the level at which truncating returns of an investment through regulatory intervention is likely to be inconsistent with the fair bet principle.

6. The table below summarises – by reference to the key parameters identified in Oxera 1 – why we believe that Ofcom's approach and assessment of the evidence do not justify the conclusion that the proposed price cuts would be consistent with the fair bet:

Key parameter for assessing the fair bet	**Ofcom assessment in WLA consultation**
Identification of the project-specific cost of capital faced by the firm at project inception.	Not considered. Only assessment of cost of capital is a forward-looking estimate (i.e. WACC[2] in 2019/20 and 2020/21 for the purpose of setting a cost based fibre charge control).
Expected returns over the lifetime of the project.	Not considered. Focus is on references to expected ***payback date*** for the original FTTC investment[3].

[1] Para 8.6, March WLA Consultation, Volume 1
[2] Weighted Average Cost of Capital
[3] Paras 8.20, Volume 1 and A8.10-A8.14, WLA Consultation

The distribution of potential cash-flow outcomes defining expected project returns	Not considered. Ofcom only includes a brief, high level and unquantified description of the "perceived riskiness of the initial investment" in three paragraphs in Annex 8[4].

7. Oxera 1 sets out quantified estimates of the three parameters above. This concluded that capping lifetime returns beneath 15% was unlikely to be consistent with the fair bet. Ofcom's own analysis in the March WLA consultation suggested that the proposed base case GEA price reductions were expected to constrain the 20-year return on our NGA investments to less than 12%[5]. In other words, Oxera's assessment indicates that, had investors in 2008 been aware that project returns would have been truncated beneath 15% (and certainly beneath 12%), they would not, on the balance of risks faced, have supported the investment.

8. Ofcom is considering the points raised in our response to the March WLA Consultation in relation to the fair bet and we have provided a number of additional internal contemporaneous documents from the period around the start of our investments in NGA.). This further submission explains our position on the fair bet further in light of: (i) issues raised by Ofcom in recent discussions; and (ii) the additional information we have provided to Ofcom.

9. We also attach an additional report by Oxera ("Oxera 2") to this submission. This report specifically considers the third parameter which is key to a robust assessment of the fair bet, namely, the shape of the distribution of returns which captures the upside and downside scenarios for returns and their relative likelihood. This concludes that the evidence from contemporaneous documents – including the financial model underpinning the June 2008 Board paper – supports the estimates set out in Oxera 1.

10. This further submission is split into two parts:

    - In **part 1**, we assess the contemporaneous evidence from 2008 to 2010, including financial forecast models. We focus on the relevance of these documents to an assessment of the fair bet particular what they show about the expectations of payback, perceptions of risk and optionality at the time the investment was being considered and assessed.

    - In **part 2**, we address a number of specific issues raised in discussion with Ofcom about Oxera's estimate of the three parameters and overall approach to assessing the fair bet. This includes reference to the Oxera 2 report.

11. We believe the evidence and analysis within this supplementary submission reinforces the arguments presented in our response to the WLA consultation. In particular:

    - A full review of the contemporaneous documents provides no evidence to support a finding that BT ***expected*** payback on FTTC investments in this charge control period.

    - The June 2008 BT Board paper and underlying financial forecasting model show a 'base case scenario' identifying the demand conditions under which proposed FTTC investments could reach payback at the Openreach level in 2021/22 – i.e. in the year

[4] Paras A8.15-A8.18, WLA Consultation

[5] Para 8.22, Volume 1, WLA Consultation

after this review period. Other demand scenarios showed payback beyond [✂] years. In any event, the assessment explored what would need to be believed (e.g. about demand) in order for the investment to be attractive. No view was offered on the likelihood of the demand conditions occurring based, for example, on expectations of market conditions

- The reference to a [✂] year payback date for FTTC investments contained in a presentation to Ofcom in the summer of 2008 was not intended to present a view of internal expectations on payback. Rather, it presented a highly simplified view of what price premium could be required to deliver a potentially acceptable return on a significant upfront investment.
- Further updates presented to a CEO-led strategic review group in 2010 (when we started full scale market deployment and announced plans to extend supply to 66% of UK homes) show, under base case assumptions, Group level payback across FTTC and FTTP (i.e. the combined 'mixed economy' case) before [✂]. However, there is no evidence around Group level payback on the FTTC investment in isolation.
- We have identified evidence to suggest that base case payback at the *Openreach* level for the FTTC element of the NGA investment had moved from [✂].
- In 2008 and 2010, the discount rate used for project appraisal was [✂] which was not the project specific cost of capital. Using a project specific cost of capital (estimated by Oxera to be higher than [✂]) would have pushed payback out still further. Oxera's estimate of the project-specific cost of capital reflects the logical expectation that the project-specific asset beta would reduce over time.
- All contemporaneous documents show that project returns were highly sensitive to a number of key variables which were uncertain ahead (and in the early years) of investment – particularly the level of price premium required to drive sufficient levels of customer demand. Those uncertainties remained in 2010 at the point we began full scale market deployment. There is no evidence to suggest the risks were mitigated by the phased deployment programme followed. We built out the FTTC network at a fast pace ahead of clear indicators showing performance against base-case take-up and price premium assumptions.
- Oxera 2 then sets out analysis of the initial June 2008 business case to support the estimates made in the Oxera 1 report about the distribution of project returns faced ahead of investment. This therefore supports the overall estimate Oxera made about how the fair bet should be assessed.

Part 1: Review of contemporaneous documents: expectations and perceptions of risk

12. Ofcom provisionally concluded that the charge control proposed "would be consistent with the 'fair bet'" based on its belief that "BT has had a fair opportunity to make a return on its original risky investment" [6]. In reaching this view, particular weight was given to Ofcom's provisional findings that: "BT would have expected payback on the first tranche of its FTTC investment to occur within the period… 2018/19 to 2020/21"[7].

13. In our response to the March WLA consultation, we challenged Ofcom's factual finding about expected payback and also challenged the sufficiency of Ofcom's analytical approach and assessment of the evidence in reaching its provisional conclusion.

14. Since this response, we have provided Ofcom with additional documentation, including financial models, from the period when the investment was assessed and the early years of deployment (namely, 2008 to 2010)[8]. In this section, we assess this contemporaneous internal evidence about our NGA investment plans, and consider its relevance to Ofcom's assessment of the factual evidence and analytical approach in considering the fair bet in the March WLA Consultation.

Relevant documents

15. In the March WLA consultation, Ofcom's assessment of BT's expectations ahead of investment focused on the "original investment case for fibre" – i.e. the plan announced in July 2008 to invest £1.5bn to provide NGA to up to 10 million UK homes. Ofcom stated that the "most relevant documents" providing insight into the "risks and expectations at the time" were: (i) a **June 2008 BT Board paper** which, among other things, proposed making the external announcement of our investment plans; and (ii) a presentation given to Ofcom in the summer of 2008 (the "**Summer 2008 Ofcom Presentation**") providing further details on the announcement[9].

16. We have now provided the following additional internal documents to Ofcom:

    - The financial model used to generate the payback figures referenced by Ofcom in the June 2008 Board paper (the "**June 2008 Model**").
    - The [✂].
    - The [✂] which provided more detail on the evolution of the fibre business case and other operational and strategic issues through the period where operational trials and early market deployment began.
    - A financial model from June 2010 which set out an updated view of costs and potential revenues from providing NGA to 66% of UK homes (the "**June 2010 Model**").

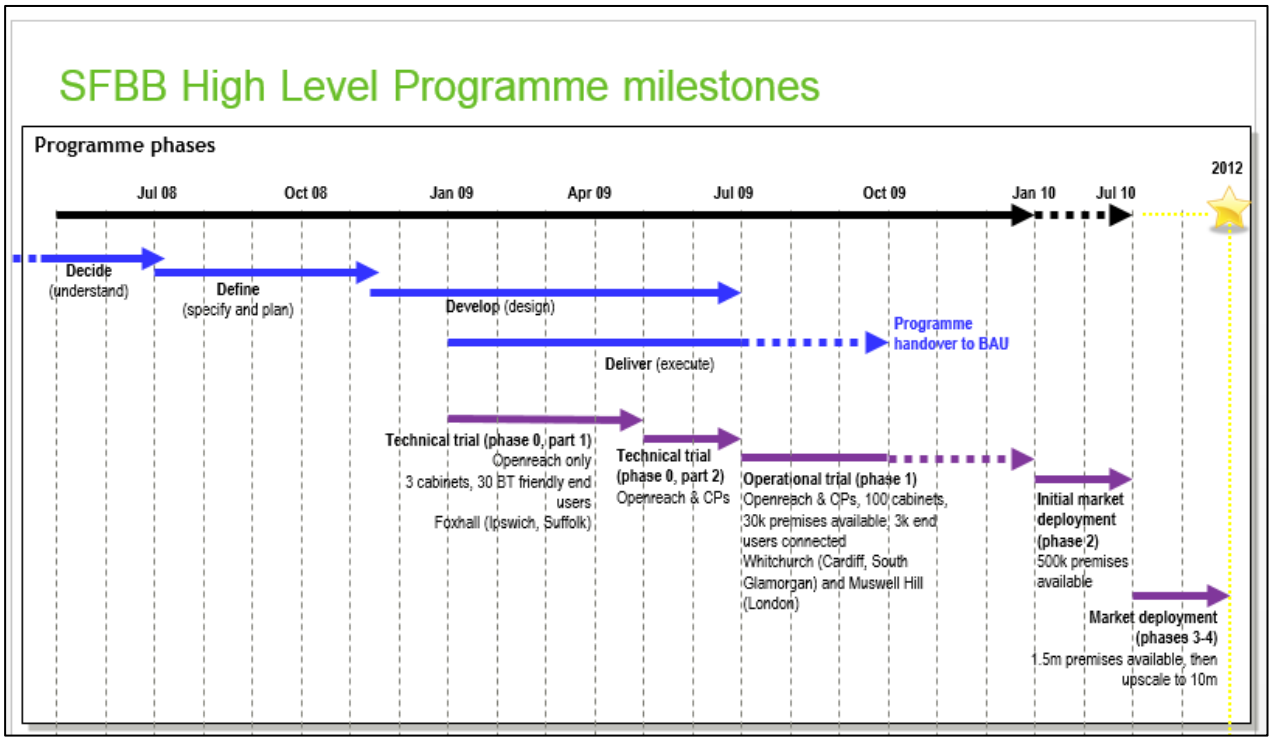
17. We have also identified other internal contemporaneous documents that we believe are informative in understanding issues relating to the fair bet:

[6] Para 8.23, March WLA Consultation, Volume 1
[7] Para 8.20, March WLA Consultation, Volume 1
[8] Response to 7th WLA s135 Information Notice, submitted 22 August 2017
[9] The presentation was given in August or September 2008.

- An internal slide showing working level analysis supporting the financial information presented in the Summer 2008 Ofcom Presentation.
- The [✂] (i.e. after the period covered by the 7th WLA Information Request).
- A model showing the Openreach level cost information split between different NGA technologies that supported some of the data captured in the June 2010 Model.

Timeline of NGA investment programme

18. To put these documents into the overall context of our NGA investment programme, we have pasted below the planned timeline for delivery of the FTTC element of the NGA strategy as of December 2008[10].



19. This timeline shows that the documents that Ofcom focuses on in the March WLA Consultation (namely, the June 2008 Board paper and the Summer 2008 Ofcom Presentation), contained internal analysis produced ahead of the "Define", "Develop" and "Deliver" phases of the programme.

20. The additional documents referred to above provide insight on the phases of work and activities in the run up to scale deployment at the start of 2010/11. The June 2010 updated business case was produced around the time the scale deployment began and, therefore, ahead of the majority of the planned capital expenditure. Information from across this period is therefore all potentially relevant in considering expectations and perceptions of risk at the beginning of the project. It has particular relevance given

[10] Extracted from the December 2008 "Super Fast Broadband Strategic Review" slidedeck supplied to Ofcom.

Ofcom's suggestion that "… risks were mitigated to some extent by the investment being split into tranches."[11]

21. The assessment below is split as follows:
    - A review of the financial information in the June 2008 BT Board paper taking account of the detail within the June 2008 Model.
    - A review of the financial information in the Summer 2008 Ofcom Presentation taking account of the additional internal analysis we have identified.
    - A review of the financial information in the June 2010 Model and the extent to which this suggested any change in the perception of risk.
    - An overall assessment of expectations, risks and the optionality within the investment project based on a review of all the internal documents referred to at paragraph 17 above.

Review of the June 2008 BT Board paper and June 2008 Model

22. Ofcom's conclusion that we expected payback on FTTC investments in this market review period was, in part, made by reference to a [✂] in the June 2008 Board paper. The specific reference in Section 4 of that paper ('Financial information') stated:

    "It is not possible to predict the financial returns from this investment at this stage. However, we have modelled a potential scenario to provide the board with some indication of the conditions needed to a deliver a return. This scenario is modelled versus the status quo, which trends and market insight show us will not be the case.

    The proposal gives an [✂]"

23. It is clear from this text (and the table that immediately followed it) that this section of the Board paper was not setting out clear expectations of the future, but showing a particular scenario based on an assumed level of price premium and take-up that *could* generate a potentially attractive return. As the paper states, the objective was to provide an indication of the demand conditions that *could* support such an investment (i.e. what BT would have to believe about demand for the investment to be attractive). It did not offer a view on the likelihood of these demand conditions occurring based, for example, on expectations of market conditions.
24. We have provided Ofcom with the June 2008 Model that generated this [✂].
25. This model allows numerous scenarios to be modelled by modifying the variables shown in the 'Control Sheet' tab of the model.[12]
26. Section 4 of the June 2008 BT Board paper shows a scenario with [✂] charges.
27. Figure 5 in Annex A of the Board paper then shows this same scenario alongside five other scenarios based on different assumptions of the monthly incremental wholesale revenue (or price premium) and take-up. Figure 5 presents the number of years until payback and the 15 year Net Present Value (NPV) of the investment for each scenario.

[11] Para A8.18, March WLA Consultation

[12] These variables can be adjusted a percentage point up or down.

Figure 5 –

[✂]

28. Although not clearly labelled as such in the June 2008 BT Board paper, the [✂] figure referenced in Section 4 and the numbers presented in Figure 5 of Annex A all related to the financial performance of the investment in the FTTC element of the mixed economy NGA programme at the Openreach level only.

29. All the numbers in the six scenarios in Figure 5 can be generated from the June 2008 Model by selecting the relevant scenario for the Openreach price in cell E26 of the 'Control Sheet' [✂] and for take-up in cell F20 [✂]) with all other variables left unmodified.

30. Under the 'Base case' Openreach pricing scenario and case 1 take-up scenario, row 155 of the 'E2E Profitability (excl. SLU)' tab shows the following discounted cumulative cashflow at the Openreach level (extract from [✂]):

Cumulative Discounted OR Cash Flow in Year

	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]
FTTC Overlay	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]	[✂]

31. The model shows that [✂]. In the model, 2008/9 is 'year 0', so [✂] year of the 20 year model – i.e. [✂]. The reference to a "[✂]" in section 4 is therefore misleading as it is a reference to the information shown by this extract and summarised in Figure 5. (e.g. payback under the base case pricing/[✂] take-up scenario is shown as [✂] in the table and the 15 year NPV figure shown in Figure 5 under this same scenario references the figure of [✂] from the column labelled '[✂]).

32. The estimated internal rate of return (IRR) of the FTTC investment at the Openreach level under different scenarios can be generated from the annual cash position set out in row 201 of tab 'E2E Profitability (excl. SLU)'. The estimated IRR of the FTTC investment at the Group level can be generated from the cash information in row 300 of the same tab.

33. We set out below the 20 year IRRs generated under the six different scenarios at the Openreach and Group levels for the FTTC investments under contemplation.

Openreach 20 year IRR

[✂]	Monthly incremental revenue		
[✂]	[✂]	[✂]	[✂]
[✂]	[✂]	[✂]	[✂]

Group 20 year IRR

[✂]	Monthly incremental revenue		
[✂]	[✂]	[✂]	[✂]
[✂]	[✂]	[✂]	[✂]

34. The June 2008 Model therefore shows, against a number of different metrics (payback, the cumulative cashflow position over each of the 20 years, IRR), the sensitivity of project performance to the assumptions about the Openreach price premium and take-up. It also allows further consideration of the impact of varying other assumptions. As explained in Part 2, Oxera has used the information within the June 2008 Model (which indicates the scenarios which formed part of the ex ante project assessment) to assess the assumptions made in the Oxera 1 report about the distribution of returns.

The Summer 2008 Ofcom Presentation

35. The March WLA Consultation also referenced the 10 year payback date for FTTC shown at footnote 3 of slide 3 of the Summer 2008 Ofcom Presentation.

[✂]

36. Internal investigation into the source of the payback date shown in the slide identified a working level slide entitled "*How the numbers fit together…*" showing how the figures in the Summer 2008 Ofcom Presentation were derived.

[✂]

37. This slide shows the assumptions supporting the aggregate-level figures for the mixed economy NGA investment shown in the main table in slide 3 of the Summer 2008 Ofcom Presentation as well as for the disaggregated FTTC and FTTP figures shown in footnote 3.

38. It is clear from this internal slide that the information presented to Ofcom was the result of an exercise to identify the monthly price premium on NGA sales that *could* support payback on the proposed level of incremental investment within [✂]. i.e. the table within the internal slide shows the basis on which the price premium was ***derived*** to deliver a given timing of payback.

39. In other words, the payback shared with Ofcom was not calculated bottom-up based on expectations relating to market conditions and key parameters; but rather a payback date was assumed, and the parameters that could deliver payback on the envisaged incremental investment spend were identified, using a simplified cash model (see below). There was no indication as to whether the conditions required to deliver the payback were judged to be a fair representation of expectations.

40. It is also clear that the price premium was not calculated using the detailed model that generated the numbers in the June 2008 Board paper and which enabled a range of scenarios to be considered. The internal slide shows a highly simplified cash investment model that assumed for FTTC:

    i. [✂] of upfront incremental capex, all incurred at start of year 1.

    ii. Straight line depreciation of the [✂] with the assumed [✂] return earned on the average value of non-depreciated assets in each year. This generates a cumulative return of [✂] over the period as shown by the table below:

[✂]

    iii. [✂] over the period.

iv. Take-up reaching [✂] million customers paying the derived monthly premium for an average of [✂] years – i.e. allowing for phased growth in take-up across the assumed base over the [✂] year period.

41. As the internal table above shows, two monthly price premium figures were derived for FTTC: one assuming no upfront connection charge (£6.85 per month) and the other assuming a £100 connection charge (£5.29 per month).

42. The figures presented in the Summer 2008 Ofcom Presentation should not, therefore, be interpreted as representing the ***expected*** outcome of the planned investment. The purpose of the presentation to Ofcom was to share some broad insight into the conditions that could support the investment plans of the scale we had announced, not to set out a detailed business case reflecting the timing of investments, pace of take-up, etc, or to assess the likelihood of the modelled demand conditions materialising. The figures should certainly not be viewed as presenting an updated view on project expectations after the June 2008 paper. We would note, for instance, that the simplified cash view given to Ofcom was not used in any of the [✂]. Put simply, it was purely indicative and not based on any substantive assessment of possible outcomes, the drivers of these outcomes or their relative likelihood.

June 2010 Model

43. The June 2010 Model [**SFBB Group case – 0610v8sl.xlsm**] provides an updated view of financial forecasts under 3 supply scenarios:

- The 40% case (i.e. to build to 10m homes)
- An "FTTC rich" case to get to 66% of homes, split approximately 75% FTTC, 25% FTTP (which was the investment announced in 2010)
- An "FTTP rich" case to get to 66% of homes, split approximately 54% FTTC, 46% FTTP

44. The Model also includes data for the 40% case based on the earlier iteration of the case generated in March 2010. The outputs of the June 2010 Model can be varied by selecting a scenario at cell B3 in the 'Volumes' tab.

45. The June 2010 Model therefore shows (i) the impact of changes between the March 2010 and June 2010 assessment of costs and revenues based on like-for-like 40% build out assumptions; and (ii) the impact of extending build-out to 66% of homes under two potential 'mixed economy' supply scenarios. The 'FTTC rich' scenario was used in the business case figures presented to the SFBB Strategic Review session in July 2010.

46. To provide context for how the figures in the June 2010 Model were used, we attach two further slide-decks from SFBB Strategy Review updates in March 2010 and July 2010. For instance, slide 9 of the July 2010 slide-deck shows the Group-level outputs for three of the scenarios in the June 2010 Model.

[✂]

47. We would note that the June 2010 Model does not break out the FTTC and FTTP cash views in the same way as the June 2008 Model so like for like comparisons are not possible. We also note that no reference is made in the Strategy Review slidedeck to expected payback, NPV or IRR on the FTTC investments in isolation.

48. The model does, however, show the cash view for each line of business (tab 'LOB') as well as for Group (tab 'Group CF'). Projections for key project metrics under the 'March 2010 40%', 'June 2010 40%' and 'June 2010 FTTC rich' scenarios are summarised below. All figures reflect the use of a [✂] discount rate at the Openreach level and [✂] for other lines of business:

March 2010 - 40% case, 'mixed economy' FTTC and FTTP

	Year of discounted payback	NPV			IRR @ year 20
		10 years	15 years	20 years	
Group	[✂]	[✂]	[✂]	[✂]	[✂]
Openreach only	[✂]	[✂]	[✂]	[✂]	[✂]

June 2010 - 40%, 'mixed economy' FTTC and FTTP

	Year of discounted payback	NPV			IRR @ year 20
		10 years	15 years	20 years	
Group	[✂]	[✂]	[✂]	[✂]	[✂]
Openreach only	[✂]	[✂]	[✂]	[✂]	[✂]

June 2010 - 66% FTTC rich (i.e. 75% FTTC, 25% FTTP), 'mixed economy' FTTC and FTTP

	Year of discounted payback	NPV			IRR @ year 20
		10 years	15 years	20 years	
Group	[✂]	[✂]	[✂]	[✂]	[✂]
Openreach only	[✂]	[✂]	[✂]	[✂]	[✂]

49. A full breakdown of 20 year NPV and payback figures for these 3 scenarios by line of business was presented in the July 2010 SFBB Strategic Review slidedeck (slide 12 below):

[✂]

50. While the June 2010 Model does not show the full cash breakdown of revenues, capex and opex by FTTC and FTTP, we have identified an internal model that provides this breakdown at the Openreach level for the base case 'June 2010 FTTC rich' supply scenario.

Openreach only: June 2010 - 66% FTTC rich scenario

	Year of discounted payback	NPV			IRR @ year 20
		10 years	15 years	20 years	
FTTC	[✂]	[✂]	[✂]	[✂]	[✂]
FTTP	[✂]	[✂]	[✂]	[✂]	[✂]

Net Present Value of Openreach investments in June 2010 Model (66% FTTC rich case)

[✂]

51. Unlike the June 2008 Model, the June 2010 Model does not directly allow different *demand* scenarios to be generated – e.g. by showing projected outcomes at different levels of price premium and take-up. The figures within the Openreach model are based on assumed [✂] take-up within the build out footprint and use the same 'Base' case [✂] Openreach price premium as in the June 2008 Model.

52. The fact that the payback period for [✂]. Therefore, references to Group level payback on the combined FTTC/FTTP 'mixed economy' case in 2018/19 do not suggest that we expected payback on FTTC investments at the Group within this charge control period.

Overall assessment of expectations and perceptions of risk at the start of the investment

53. The assessment above shows there is no evidence to support the view that we began investing in FTTC on the basis that payback would be reached in this charge control period. The Summer 2008 Ofcom Presentation presented a scenario under which payback could have been achieved before 2020/21, but this was based on a highly simplified cash model, which was not underpinned by a substantive assessment of possible outcomes, the drivers of these outcomes and their relative likelihood, nor was it presented to the BT Board.

54. We also note that payback dates and NPVs at different points in time under the various demand and supply scenarios were based on the standard corporate discount rate used to assess comparative performance across projects, not on a project-specific cost of capital for the NGA investments. Discounting at the appropriate project-specific cost of capital (discussed in Part 2 below) would push the date of payback under all scenarios out and would reduce NPVs.

55. Ofcom regards regulation after the expected date of payback – and potentially before this date if returns are significantly above the benchmark cost of capital – as consistent with the fair bet. We consider that the date of expected payback has, at best, a tenuous relationship with the parameter of key interest, namely the critical level at which returns could be capped without changing the fundamental requirements for investments to proceed – i.e. that the expected return on the investment equals the project-specific cost of capital.

56. Put simply, reaching actual payback (at the project-specific WACC) is a necessary, but not a sufficient condition for regulation to be imposed. It cannot simply be assumed that

investors would go ahead with an investment if they expected regulation to be imposed after expected payback because regulation imposed after expected payback might still cap upside returns below the level needed to be consistent with honouring the fair bet. This can only be identified by considering the ex ante risks faced by investors at the point they decided whether to invest in FTTC.

57. The assessment of the June 2008 Model highlights the extent to which project outcomes – whether assessed by reference to the date of discounted payback date or other financial metrics – were sensitive (i) to variance in demand assumptions made around the price premium and take-up (as shown in Figure 5 of Annex A of the June 2008 BT Board paper) and (ii) to a range of other cost and revenue assumptions – e.g. the retail level price premium and the mix of internal and external sales (as shown by varying parameters within the 'Control Sheet' tab of the June 2008 Model). The Oxera 2 report, considered in Part 2, therefore uses the June 2008 Model (i.e. a contemporaneous tool for assessing risks around base case outcomes) to consider the distribution of Group returns in particular driven by possible variance in the Openreach price premium. Oxera then considers whether this validates the assumptions made in Oxera 1 about a key parameter in their fair bet assessment, namely the distribution of returns around the expected return (put simply, the ex ante risk of the investment)

58. Ofcom's approach in the March WLA Consultation did not attempt to quantify the risks faced at the start of the investment or, for instance, assess the spread of potential outcomes around the base case scenarios. However, Ofcom did more generally consider perceptions of risk around the FTTC investment at paragraphs A8.15 to A8.18. Ofcom's conclusion was that: *"… while we do believe that BT's investment in fibre was risky, the risk was mitigated to some extent by* ***the investment being split into tranches*** *and expectations about* ***the eventual evolution of demand****."* [emphasis added]

59. In this remainder of this section, therefore, we consider the factual evidence supporting Ofcom's assessment of risk against these two factors.

Investment in tranches

60. Ofcom stated at paragraph A8.15 of the March WLA Consultation:

> *BT planned to undertake its investment in two tranches, and we consider that the risk associated with subsequent tranches is significantly reduced. The risk of the first tranche was also mitigated to some extent as BT would have had flexibility to halt the project before the full £1 billion had been spent, if conditions had turned out to be worse than expected, mitigating the potential losses and reducing the riskiness of their investment. BT's investment case for the first tranche notes that the "*proposal will start with an operational trial before moving to a geographically targeted market deployment and then a national deployment*" and that at each stage it would "*assess if conditions are right to continue.*"*

61. As shown in the timeline at paragraph 19 above, while BT's initial announcement related to the plan to provide fibre access to 10m/40% of homes by 2012, the subsequent announcement to extend build out to reach 66% of homes by 2014 was made around the same time that scale "national deployment" was starting. The operational trials and

geographically targeted early market deployment served around 500,000 homes i.e. at that point around the start of 2010/11, we had reached only about 2% coverage.

62. Therefore, we would note:

- The plan to reach 66% was not based on evidence about the success of the plan to serve 40%. At the time we announced the extended build out plans, there was very little additional evidence available from the trials and early market deployment about the key demand side uncertainties identified in the June 2008 Board paper – i.e. the wholesale price premium and the level of take-up this would support.
- While the 66% plan was clearly an extension of the initial 40% plan, it is not correct to present the investments as falling into two discrete tranches where the risks associated with investments to reach the additional homes can be considered to be lower. As the contemporaneous documents show – see the various [✂] slidedecks - the reality is that once initial trials and early market deployment was complete, we were working to a strategy and operational plan to deliver the full 66% coverage announced. Activity before this date fell into the Define, Develop and Deliver (by way of technical and operational trials) phase of the project.

63. Ofcom has suggested that we had the ability to halt the project before the "full £1 billion [*i.e. the initial level of incremental capex envisaged*] had been spent". Ofcom seems to suggest that this 'optionality' mitigated the risks and uncertainties faced at the outset. The following prevented any material flexibility in this regard:

- BT's public announcement in 2008 signalled BT's strategic direction and investment commitments to investors and other external stakeholders (including Ofcom and the UK government).
- A minimum level of coverage was required if CPs were to get on board for a mass market offering. Thus, even had initial commercial results been poor, reducing the footprint would have had its own risks – increasing average costs due to lost economies of scale, and losing the prospect of any future CP-generated demand.
- The rollout programme was delivered by Openreach as quickly and efficiently as possible, passing, on average, over 1 million additional homes each quarter from 2010/11 onwards. Our base case assumption at start of deployment was that it would take 30 months for a cabinet to reach the target take-up. So cabinets installed in the early market deployment phase would not have been expected to reach the target take-up until early 2012/13 and so early observations provided little information on the likelihood of hitting targets.
- Even at an aggregate level, the bulk (over 80%) of FTTC build capex (excluding investments in systems and connecting individual lines) was spent before take-up had reached [✂] at prevailing prices.

	FTTC build capex (£M)		Take-up	
	Annual	Cumulative	m	%
2008/9	[✂]	[✂]	[✂]	[✂]
2009/10	[✂]	[✂]	[✂]	[✂]
2010/11	[✂]	[✂]	[✂]	[✂]
2011/12	[✂]	[✂]	[✂]	[✂]

2012/13	[✂]	[✂]	[✂]	[✂]
2013/14	[✂]	[✂]	[✂]	[✂]
2014/15	[✂]	[✂]	[✂]	[✂]

- There was also a large element of fixed costs incurred in the programme, which could not have been avoided by reducing the number of cabinets deployed.

64. We do not, therefore, accept that risks were capable of being mitigated in the early years of investment to any material extent given the commitment made to deliver NGA services signalled in June 2008 and May 2010 and the pace of roll-out ahead of demand materialising.

Eventual evolution of demand

65. Ofcom suggests that risks were also mitigated by the expectation that, over the longer term, demand and willingness to pay for higher speeds were eventually expected to increase. But this general observation says nothing about the scale of the risks to the long term value of the investments where demand was slow to materialise (whether in terms of take-up and/or price premium). The impact that uncertainty about the willingness to pay a premium for higher speeds at the outset of the project. If the downsides had materialised expected payback would have been delayed and the NPV of investments at different points in time would have been reduced.

66. Over the longer term, there were also increased uncertainties about technology shifts and competition (e.g. the emergence of lower cost and/or higher capability access services after demand materialised). The decision faced in 2008 was whether to begin the deployment programme utilising the available technology at that point. The analysis considered the risks of lower demand scenarios and the opportunities of higher demand scenarios and supported the investment plan at that stage.

Part 2: Estimating the parameters relevant to the fair bet assessment

67. In this Section, we consider issues raised by Ofcom about Oxera's estimate of the 3 key parameters identified as relevant to assessing the fair bet. That is:
    - The ex ante project-specific cost of capital
    - Expectations of returns
    - Distribution of returns

The ex ante project specific cost of capital

Estimate of the relevant asset beta

68. As both the Brattle Group[13] and Oxera report set out, an assessment of an investment case should be made using the project-specific WACC to discount expected returns. The project-specific WACC should only reflect the systematic risk involved in the project, with risks which are non-systematic (or diversifiable) reflected in the project cash flow scenarios (although cash flow risks which are more systematic in nature may be captured through such scenarios, subject to avoiding double counting with the WACC). The same distinction was recognised by Ofcom in January 2005 in "Ofcom's approach to risk in the assessment of the cost of capital".[14]

69. Such a project-specific WACC is then a genuine "hurdle" rate in the sense that a project should proceed if the expected Internal Rate of Return (IRR) exceeds this WACC (or if the Net Present Value (NPV) is greater than zero using the project specific WACC as the discount rate for expected future cash flows).

70. The fundamental parameter which captures project specific risk is the asset beta. This measures the volatility of project returns relative to the market as a whole (i.e. systematic risk) without considering project finance.

71. Ofcom has queried why the rest of BT ("RoBT") asset beta of 0.68 estimated by Ofcom as part of the review of LLU charges in 2009 should not be used as a proxy for the asset beta applicable to BT's fibre investment at project inception.

72. We see two fundamental problems with using the 2009 RoBT figure in this way.

Problem #1: asset beta of 0.68 based on historical data across a mix of projects

73. The RoBT asset beta would also have captured the systematic risk for all parts of the business other than the copper access business within Openreach. This would have represented an average of new, mid-life and more mature projects and activities, none

[13] "Review of approaches to estimate a reasonable rate of return for investments in telecoms networks in regulatory proceedings and options for EU harmonization", Final Report, A study prepared for the European Commission DG Communications Networks, Content & Technology by The Brattle Group, 2016. This report sets out the reasons why NGA networks may be expected to have higher systematic risk than legacy networks.
[14] Published on 26 January 2005 – see for example paragraph 5.5. Paper url: https://www.ofcom.org.uk/__data/assets/pdf_file/0019/50743/cost_capital.pdf

of which has been shown by Ofcom to be, in principle, comparable in systematic risk profile to the NGA investment at project inception.

74. Indeed, a blended average of systematic risk across projects and activities at different points in their life cycle (including those midway through their life, or nearing the end of their life) is very likely to under-state systematic risk for a project at inception which (due to factors such as capital leverage as described below) will be highest at inception when capex has yet to be spent.

Problem #2: use of asset beta on 0.68 would suggest systematic risk relating to NGA was increasing over time which is counter-intuitive

75. It is common ground that it is reasonable to assume that systematic risks (and therefore the asset beta) of BT's NGA investment have declined over time. For instance, in Annex 16 of the March consultation, Ofcom states that, "[e]*vidence… suggests that systematic demand-risk facing NGA services has reduced over time*."[15] In support of this, Ofcom mention "[u]*se of high bandwidth services is becoming more common*"[16] (and that demand might therefore remain robust if incomes fell) and "[w]*hile the systematic demand risk of NGA services may have been higher in the past, it is likely to have reduced over time*" (emphasis added).[17]

76. In relation to other factors which can lead to higher systematic risk, Ofcom accepts that capital leverage and long term payoffs (which are both highlighted in the Brattle report) are relevant factors to assess.

77. As regards capital leverage, this may be expected to have the most significant impact on systematic risks early in the project life. This is because, at that stage, the present value (PV) of committed capital will be at its highest relative to the PV of expected benefits (i.e. the ability to earn margin over variable costs). As a result, the "risk magnifying" effect from demand fluctuations will be reflected in a high asset beta. Later on in the project lifetime, the present value of committed fixed outlays would be lower as a proportion of expected benefits with the effect that variations in demand would have a smaller change in the returns for investors. Capital leverage, and its upwards effect on the asset beta, will therefore decline over time.

78. As part of its assessment of the appropriate forward looking WACC for fibre, Ofcom states that "[g]*oing forward, we consider that capital leverage effects are unlikely to result in significant differences in the asset beta for NGA activities compared to other telecoms usage services*." This also suggests that Ofcom sees these effects as declining over time.

79. As regards long term payoffs, Ofcom notes the finding of the Brattle report that, where payoffs extend a long time into the future, systematic risk can be higher because the value of the investment will vary more strongly with macroeconomic conditions. In this context, Ofcom accepts that "*the expected payback period may have resulted in a higher asset beta for NGA activities at the time of the initial investment*"[18] even if payoffs have become more apparent over time as the premium that customers are willing to pay over standard broadband, and the extent of take up has become clearer.

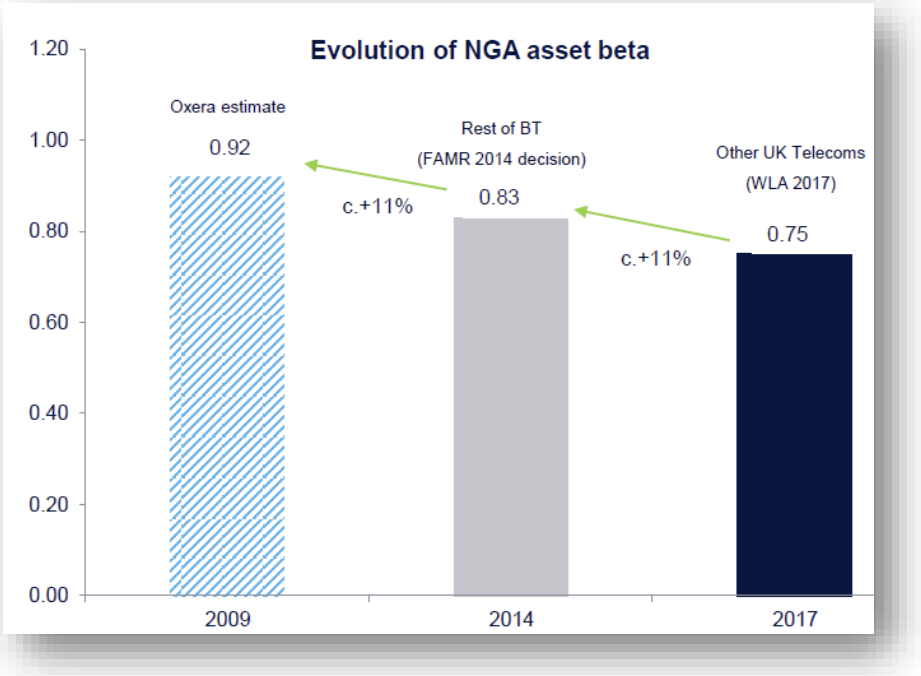
[15] A16.152
[16] A16.152
[17] A16.153
[18] A16.160

80. Ofcom states that "[g]*oing forward, we do not consider that the issue of long-term payoffs will contribute to a material difference in risk between BT's NGA services and other telecoms usage services*"[19] but this does not detract from the fact that, in the past, systematic risk was higher due to this factor.

81. Ofcom concludes that, in 2017, the appropriate forward looking asset beta for NGA is 0.75 on the basis that "*NGA services are likely to face higher systematic risks than copper access services but are likely to share similar risk characteristics to other telecoms usage services going forward*."[20]

82. Given the reasons (outlined above) for the asset beta to have declined, it must be the case that at project inception, the project-specific asset beta was higher than 0.75. In 2014, Ofcom also estimated an asset beta for the RoBT – which would have included NGA – of 0.83. To use an asset beta of 0.68 for the project specific WACC in 2008/9 is therefore inconsistent with economic reasoning as it is lower than the relevant asset betas identified by Ofcom later in the project lifetime at both 2014 and 2017.

83. The Oxera report estimates the project specific WACC by extrapolating back from the asset betas identified by Ofcom as relevant in respect of NGA – i.e. the 0.75 and 0.83 from WLA 2017 and FAMR 2014 respectively. This assumes a gradually declining level of risk over time which is represented by a simple linear extrapolation backwards to the assumed 0.92.[21]

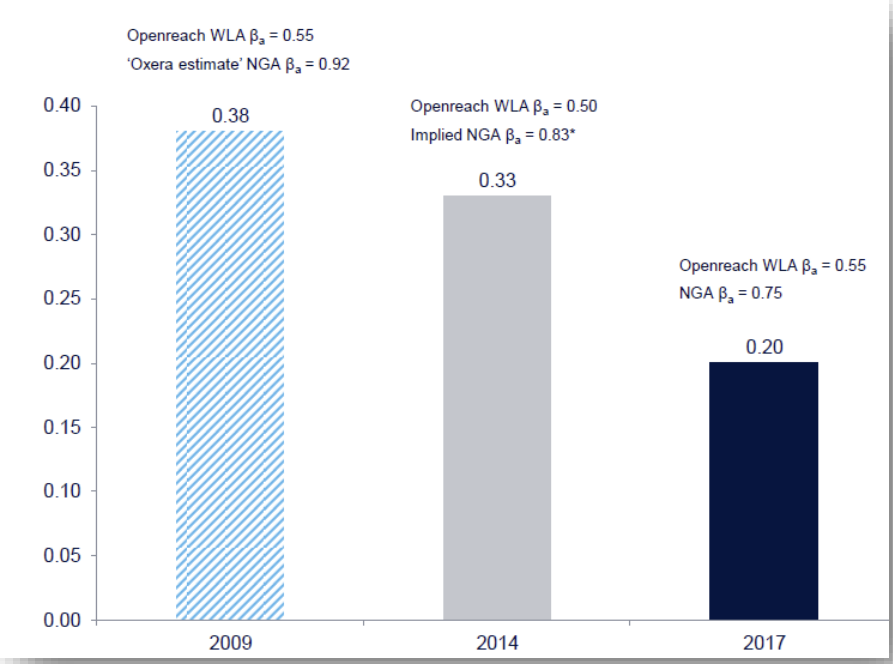


84. In the absence of a contemporaneous project specific WACC used for project appraisal, it is inevitable that this parameter can only be estimated (as are, in fact, all of Ofcom's

[19] A16.161
[20] A16.162
[21] The 0.92 being 0.83/ (0.75/0.83)

WACC estimates for disaggregated parts of the BT Group business)[22]. Put simply, this involves placing the NGA investment at project inception on the risk spectrum by reference to some reasonable benchmarks. Oxera has used reasonable benchmarks for the asset beta in the years after the initial investment and makes the reasonable assumption that if risk declines over time, the asset beta at the project inception will be proportionately higher (indeed this is a cautious assumption if the risk declined more quickly than the linear extrapolation assumes).

85. Oxera also cross check the ex-ante estimation of the fibre asset beta by reference to the spread over copper (i.e. how much more risky the NGA project was at the outset compared to the risk associated with a mature, legacy asset).[23] They find that an estimated asset beta for NGA at project inception of 0.92 results in a spread of 0.38 over copper. This is not materially higher than Ofcom's implied spread in 2014 of 0.33. An asset beta of 0.92 in 2009 looks, therefore, conservative given that the spread will be wider in the early years of the NGA project due to the higher systematic risks at this stage compared to copper which exhibits a more stable risk profile.



How Oxera's estimated project specific cost of capital relate to the [✂] discount rate that was included in a presentation setting out the case for NGA investment in 2008

86. It has been standard practice in BT to calculate the period over which a project reaches payback using a standard commercial discount rate. This allows simple comparisons

[22] For example, when Ofcom has considered the WACC for Openreach's copper access business, it has set out a range of possible asset betas for this notional business (a legacy services, access only, business) and for this purpose has considered benchmarks. In the WLA consultation, for five UK network utilities, Ofcom showed a range of asset betas from 0.40 to 0.66, with an average of 0.46. Ofcom's approach has been to set an asset beta for Openreach which is in general slightly higher than those in the monopoly utilities, but still one which is lower than other UK communications providers; the most recent proposal is 0.55.

[23] See slides for the meeting on 12 July.

between projects: i.e. longer payback dates will be generally perceived as entailing more risk for shareholder funds and, other things being equal, offering less attractive investment options. However, the time horizon to expected discounted payback is used as one metric to consider an investment case, alongside others such as the internal rate of return (IRR). The sensitivity of any case to key demand and supply side assumptions will also be considered.

87. Agree As Ofcom notes, in the June 2008 Board paper and in the subsequent presentation to Ofcom, reference was made to the use of a [✂] discount rate in considering the projected value of any fibre investment. As detailed in Section 4 below, the underlying model used to generate the figures in the Board paper shows that this [✂] discount rate was only applied to cashflows at the Openreach level. A discount rate of [✂] was used for cashflows generated by activity within the rest of BT. Both these rates were the standard commercial discount rates applied at that time across all BT projects. As noted above, the use of these standard discount rates did not imply that if the fibre investment generated an IRR of [✂] at the Openreach level and [✂] at the downstream level, this would have (or should have) been sufficient for the investment to proceed.

88. For projects with large upfront investment and uncertain outcomes which are competing for scarce capital and scarce managerial resource, it is normal for decision makers to look at a range of qualitative and quantitative metrics to help inform the decision, for example, the NPV/capex ratio which is currently examined as part of the investment appraisal framework in BT.

89. Project specific risks tend to be captured, therefore, through quantitative and qualitative assessment factors, such as the strategic fit of the project and the perceived robustness of the forecasts, as well as the estimated payback duration and other numerical metrics. Ultimately, senior management use their judgement in coming to final decisions based on a range of financial and qualitative data presented to them, and not only on the long term value of a project as discounted at a particular rate.

90. The issues around a hurdle rate were set out succinctly by Virgin Media in their Response to the WLA Consultation:

> "*Very often a company will have a standard investment hurdle rate that is applied to all investments, independent of risk. It is simply impractical to generate a new discount rate for each project to reflect its specific risk. A 2007 survey found that 80% of firms with multiple divisions "always" or "almost always" use firm-wide hurdle rates, thus ignoring differences in division risk (and certainly, therefore, ignoring differences in project risk). This is not to say that investment decision makers ignore the risk level of particular investment options. Rather, they make a qualitative judgement, assessing the NPV (calculated using the standard hurdle rate) against the perceived risk. An apparently NPV-positive project may be rejected, if the scale of that NPV does not justify the risk involved*." [24]

91. There is therefore no direct relationship between Oxera's estimated project-specific cost of capital and the [✂] discount rate included in BT's board papers. These figures capture

[24] Wholesale Local Access Market Review [Response], Virgin Media paragraph 99.

different risks,[25] serve different purposes, and are used in different contexts. BT's standard corporate discount rate was used as one of many indicators to assess the relative profitability and strategic fit of the NGA project against other potential uses of the capital. Oxera's estimate, on the other hand, was undertaken with the objective of ensuring the fair bet principle has been honoured. There is no reason why, a priori, these two figures should be equivalent.

Taking account of changes in systematic risk over time

92. During the meeting on 12 July, Ofcom asked an open question regarding how the fact that risks are known to decline over time should be taken into account in the calculation the NGA asset beta at project inception, and more generally, the project specific WACC.

93. Declining systematic risks are captured in two ways in Oxera's analysis.

94. First, it should be noted that the calculation of an asset beta at a point in time already contains information about investors expected distribution of risk over the lifetime of a project, or portfolio of projects. Indeed, the asset beta is estimated based on historic estimates of the volatility of equity returns (equity betas), which themselves contain investors' expectations about the future performance of an asset. Therefore, conceptually, an asset beta should be understood as already containing present and forward-looking expectations about an asset's performance, at the point in time that the calculation is being made. Therefore, to the extent that it is expected that future risks will decline, such information will already be captured in the asset beta being measured today.

95. Second, to the extent that systematic risks decline, and future capex can be de-linked from the original investment decision (ie, there is a degree of optionality in the capex programme which do not accept was the case to any material extent), Oxera's approach to estimate a lower bound for the project-specific WACC as weighted average of different capex tranches would take account of this.

96. Indeed, reflecting the assessment of optionality outlined above, Oxera assesses a higher and lower bound investment weighted WACC as follows:

    - A higher bound of 12.8% which assumes that the degree of optionality associated with the capex profile was low and that BT had limited scope for revising the capex programme post 2010;
    - A lower bound of 11.4% which assumes that there is a significant degree of optionality associated with the capex profile –particularly for investments after the project has matured (c. 2017). Note that the cost of capital under this scenario has not been adjusted for the cost of the option value which would tend to edge the cost of capital higher.[26]

97. Assuming that further optionality was available in 2014/15 when the appetite of CPs other than BT Consumer to market fibre might have been observed, the impact on the WACC of applying the 2014 asset beta of 0.83 to the subsequent tranche of investment

[25] Oxera's discount rate captures project specific risk in a single rate, whereas BT's discount rate of 10% is the rate deemed appropriate at different points in time to capture risks, on average, across BT's investments and activities.

[26] An illustrative explanation of this effect is given in Annex 2 of the Oxera paper.

(i.e. between 14/15 and 16/17) is anyway small because the levels of investment in these years was relatively low.

Expected project returns and the distribution of cashflow risks

98. The second and third parameters set out in Oxera 1 are closely related in that ex ante expectations of project outcomes reflect assessments of the range of potential outcomes that could materialise.

99. The Oxera 2 report takes as its starting point that the June 2008 Model provides base case expectations that informed the BT Board's support for the NGA investment strategy. Oxera use the 20 year IRR from that model (for FTTC at both the Group and Openreach level) as the key metric for assessing whether the project would deliver expected returns equal to the project-specific cost of capital.

100. The Oxera 2 report then explores how the shape of the distribution of the Group IRR is affected by the potential range of scenarios and the variability of the Openreach pricing premium based on the scenarios in the June 2008 Model and evidence of FTTx pricing premiums across Europe contained in the June 2008 BT Board paper. Using this information, Oxera derive a conservative distribution of the Openreach pricing premium.

101. The distribution of the Group IRR is then calculated by running simulations (i.e. selecting the value of the Openreach pricing premium parameter at random from the distribution, and recording the resultant impact on the project Group IRR).

102. On the basis of this analysis, Oxera identify an expected (average) IRR of [✂] and a standard deviation of [✂]. Given this shape of the distribution of returns, Oxera find that a charge control capping returns below a critical level of [✂] would breach the fair bet principle, since it would result in an expected IRR of less than [✂] (the high-end of Oxera's estimated the cost of capital range). This is consistent with the result in Oxera 1 (where the distribution of returns was estimated rather than derived by reference to contemporaneous documents).

103. The analysis only considers the impact of one parameter (the Openreach pricing premium) on the Group IRR. Oxera note that introducing the impact of other key parameters, such as the BT Retail pricing premium and the take-up rates, would increase the critical level of capped returns even further.

104. The Oxera 2 report is provided alongside this submission.

The risk of double counting of risks in Oxera's approach

105. During the meeting on 12 July, Ofcom suggested that there could be potential double counting in the application of the fair bet approach by Oxera due to the use of a project WACC which takes account of project-specific systematic risks, as well as capturing the effects of systematic risks in distribution of cash flow returns.

106. In short, while it is correct that Oxera's approach implicitly includes systematic risks in both the project-specific WACC and the distribution of returns, this does not amount to double-counting since the WACC and the distribution of returns are two separate concepts which play a different role in an investor's assessment of the project (and therefore, in the fair bet framework)

107. The WACC rewards investors for non-diversifiable systematic risks. This captures the volatility of returns and investors' appetite for, or aversion to, risk. As far as we understand it, Ofcom is not raising an issue regarding the need to account for project-specific systematic risks in calculating the appropriate WACC for the FTTC investment. We would agree with this. Indeed, Ofcom's use of different WACCs for different parts of BT recognises this principle, and the issue we face here is about estimating the risk of one particular project within the wider BT portfolio.

108. Therefore, we interpret the question that Ofcom is raising as whether systematic risks should also be taken into account in the shape of the distribution of returns (ie, cash flow risks). We believe that it should, for the reasons we explain below.

109. The shape of the distribution of returns captures the possibility of bad or good outcomes materialising and is an entirely different concept to the project-specific WACC. Understanding the shape of the distribution of returns is an essential step in the calculation of the expected return of the project in the absence of regulation—E(IRR)—and the expected return after a price cap—E(IRR)*. These are the key elements in the application of the fair bet framework, which requires E(IRR)* to be greater than the WACC.

110. If we were to exclude one source of cash flow risk caused by systematic factors (eg, general macro-economic conditions impacting on the technology, cost or demand risk) the resulting shape of the distribution of returns would fail to capture the true range of potential return scenarios. Analysing the impact of a price cap on E(IRR) on such a narrower distribution of returns would thus fail to reward investors for the risks they are taking, and may therefore result in a failure to honour the fair bet principle.

111. To see why, consider a hypothetical project where the entire source of cash flow risk is systematic in nature (ie, it is driven by how the wider economy will perform, or government's interest rate policy). Suppose further that the expected return of such a project E(IRR) is higher than the project-specific WACC. Hence, in the absence of price cap regulation, the project would go ahead.

112. If, an attempt to avoid perceived double counting of risks in the fair bet framework, the regulator were to assume that standard deviation of returns is 0%,[27] this would imply that the project carries no cash flow risk and the investor would expect to make returns in excess of the project WACC with certainty.

113. However, it is clear that this approach would fail to honour the fair bet framework. The E(IRR) of the project is not certain and carries a (potentially large) degree of risk. Hence, if investors knew that the project's returns would be capped on the upside, the expect return would fall—ie, E(IRR)* would be less than E(IRR). We can therefore be certain for this hypothetical project, capping returns at the WACC would result in E(IRR)* lying below the WACC, thereby breaching the fair bet principle.

114. For these reasons, there is therefore no double counting of risks when systematic risks are captured in both the project-specific WACC and the distribution of returns (albeit capturing different types of risk). In fact, quite the opposite. It is essential that all cash

[27] Given that the entire source of cash flow risk is systematic, avoiding a supposed double-counting of risks would require assuming that there is no cash flow risk around the E(IRR) of this project. This is equivalent to assuming the standard deviation of project returns is 0% around the mean.

flow risks are properly accounted for in the distribution of returns in order to honour the fair bet principle.

115. In any case, it is also important to note that the main drivers of the distribution of returns in the FTTC business case were not systematic in nature (economic growth, etc.), but rather, they were idiosyncratic risks – eg, the fibre price premium, take up of FTTC, technology risk, etc. As such, should Ofcom continue to be concerned about the potential for double-counting of systematic risks in the fair bet framework, the materiality of this issue is likely to be very low.