

Vertical integration of Openreach – the impact on competition and investment

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Executive Summary

1. In 2002, RBB Economics produced a paper which considered the potential costs and benefits of vertical integration in the telecoms industry. That paper identified several reasons why vertical integration is likely to deliver important benefits, notably in terms of enhanced investment incentives. Often, these advantages arise because of the complementarities that exist between activities at different stages in the supply chain. This means that some of the benefits of investment at one stage of the supply chain will 'spill over' to other stages, and will be lost to the investor under separated ownership. In addition, the underlying complementarity often means that there are significant benefits to ensuring that activities undertaken at different stages in the supply chain are effectively coordinated.
2. A key insight from economic theory, therefore, is the positive role that integrated ownership can play in incentivising investment. Our high level review suggests that this has been relevant to Openreach's performance in practice. In particular, BT's downstream retail business has proved a critical "anchor tenant" for Openreach's investment in superfast broadband infrastructure. The value of that investment depended on downstream take-up of superfast broadband services. In turn, the level of take-up depended on retailer marketing of those services to consumers. Integration provided Openreach with assurance that such marketing would be forthcoming, and that the benefits of its investment would not be appropriated by downstream operators (through so-called 'hold-up') either, thereby de-risking that investment.
3. Upstream investment in superfast broadband is liable to have a positive impact on demand for other retail products and services too; e.g. where end users are looking to access content via the internet. Symmetrically, downstream investments in content and other activities that attract end users is likely to have expanded demand for Openreach's broadband products. Retail pricing policies, including the bundling of content and broadband services, will also have affected demand for Openreach's services.
4. If arm's length contractual solutions could have provided an effective alternative, the realisation of these benefits would not have depended on vertical integration. However, the complexities and uncertainties associated with the development of superfast broadband mean that it would have been very difficult to replicate the benefits of vertical integration through contracts in practice.
5. At the same time, vertical integration gives rise to costs as well as benefits; otherwise, all activities would be organised in one large, vertically-integrated entity. Indeed, some theories predict that the costs and benefits of vertical integration go hand in hand, with the resulting changes in ownership reducing some investment incentives at the same time as they enhance others. Such theories imply that the on-going vertical integration of Openreach with BT's downstream businesses could lead to under-investment in the access network if investment incentives were focused on those other activities. The evidence we have reviewed does not suggest a distortion in this respect in practice. However, we would expect this to be a subject for consideration as part of Ofcom's Strategic Review of Digital Communications.

6. The principal competition concern raised by Openreach's vertically-integrated status is that it might result in foreclosure of BT's downstream competitors; i.e. that a failure to obtain suitable inputs – or inputs on suitable terms – will prevent BT's downstream rivals from competing effectively. (Even then, such a scenario would justify intervention only if this would undermine the competitive process itself, rather than simply the prospects of those particular competitors.)
7. Such a concern could arise if access to essential Openreach services was only available to BT's downstream rivals on uncompetitive terms. However, the Undertakings put in place in 2005 are focused precisely on ensuring that competitors are provided with equal access to the products supplied by Openreach, and to the processes whereby those products are amended and updated. The evidence we have reviewed, both in terms of the functioning of the Equivalence of Input (EoI) process established by the Undertakings and the market outcomes it has delivered, does not suggest that foreclosure has occurred.
8. A subtler concern voiced by some postulates that Openreach's strategic investment decisions have favoured BT's downstream interests. However, a legitimate concern could arise only if Openreach had undertaken investment which (1) has 'crowded out' alternative investment that would have benefitted competition, (2) has not delivered offsetting benefits in terms of the services competitors are able to provide, and (3) consumers are made worse off as a result.
9. If BT's ownership of Openreach has encouraged desirable investment that would not otherwise have taken place, without undermining the services provided to competitors, then this is a positive consequence of integration. This should not be denigrated even if the investment is utilised only by BT's own downstream operations (which is anyway not the case in respect of superfast broadband, for example). If that investment has allowed BT's competitors to offer improved services too, those improvements might offset any other, crowding-out effects. (The EoI regime will ensure that competitors are provided with access on non-discriminatory terms.) Even if improvements in the Openreach services utilised by BT's downstream businesses (e.g. enabling superfast broadband) would come at the expense of services utilised by competitors, a careful evaluation of the trade-offs involved would be required to determine whether consumers were better or worse off overall as a result.
10. In any event, had Openreach focused unreasonably on developing access solutions which favoured BT's own downstream business at the expense of competitors, then we might have expected to see those competitors making greater use of the Statement of Requirement (SoR) process, and lodging more complaints at its outcomes. In practice, we understand that only one formal complaint has been made, and this was not upheld.
11. Ultimately, the relevant test is whether competition and consumers' interests have been undermined by Openreach's integrated status and the investments that it has delivered. The competitive reality is that BT faces three major fixed broadband rivals. One of these (Virgin) doesn't even rely on Openreach, whilst the other two collectively account for more of the connections provided by Openreach than BT itself. It is difficult to see how this market structure could provide the backdrop to a foreclosure problem.

12. It has also been suggested that separation would reduce the costs of regulation. However, so long as access to the facilities operated by Openreach is critical to downstream service provision, the on-going need for extensive regulatory scrutiny seems inevitable.
13. Significantly, the Undertakings impose costs of their own, by limiting some of the benefits that vertical integration can deliver. An element of judgement and flexibility is therefore required in establishing the right balance between ensuring symmetry of treatment for all downstream competitors and preserving as much of the investment and coordination efficiencies of vertical integration as possible. The Strategic Review should, therefore, consider whether the Undertakings in their current form strike that right balance.
14. Finally, we would observe that the process of changing ownership structure would itself be likely to involve significant transformation costs. These costs of transformation would affect the overall costs and benefits of structural separation of Openreach, and hence the overall merits of undertaking such a change.

1. Introduction

15. In 2002, RBB produced a paper (“the 2002 Paper”) – part-funded by BT – which considered the potential costs and benefits of vertical integration in the telecoms industry.¹ Amid suggestions that outcomes might be improved if BT were to be broken up, the paper offered an economic perspective on the merits of continued integration.²
16. Following Ofcom’s 2004 Strategic Review of Telecommunications, and in lieu of a reference to the Competition Commission, BT subsequently agreed to undertakings (“the Undertakings”) which resulted in the functional separation of the Openreach business within the overall BT Group.³ The Undertakings were designed to address Ofcom concerns that, as a vertically-integrated, market power-holding provider of network access, BT had “*both the ability and the incentive to discriminate against its downstream competitors, who are also its wholesale customers*”.⁴ Indeed, Ofcom said it suspected that “*BT may have engaged in conduct which has had the effect of restricting competition*”.⁵
17. In March 2015, Ofcom initiated another review – this time, a Strategic Review of Digital Communications – “*to take stock of the effectiveness of the rules arising from the last major review, 10 years after they were introduced*”.⁶ An evaluation of performance under the Undertakings is central to this latest review and the possibility of further, structural separation of Openreach is one of the options on the Review agenda.⁷ (Both Sky and TalkTalk reacted to the announcement of the Review by immediately calling for such structural separation of Openreach from the rest of BT.⁸)
18. Ofcom has said that the Review will focus, in particular, on:
 - “*ensuring the right incentives for private-sector investment, which can help to deliver availability and quality of service;*
 - *maintaining strong competition and tackling obstacles or bottlenecks that might be holding the sector back; and*
 - *identifying whether there is scope for deregulation in some areas*”.⁹
19. These issues were at the heart of the 2002 Paper. Specifically, we analysed the role of vertical integration in incentivising investment, as well as the potential for foreclosure of competitors, and the effects both on and of regulation. This seems an opportune moment,

¹ RBB Economics: *Untying the Gordian Knot? Costs and Benefits of Vertical Separation in Telecoms*, October 2002.

² See, for example, House of Commons Select Committee on Culture, Media and Sport: *Fourth Report – Communications* (May 2002), paragraph 74.

³ See Ofcom: *Statement on undertakings in lieu of a reference under Part 4 of the Enterprise Act 2002*, 22 September 2005.

⁴ Ofcom: Notice under Section 155(1) of the Enterprise Act 2002, 30 June 2005, para 1.4.

⁵ *Ibid.*

⁶ Ofcom media release, 12 March 2015.

⁷ See Ofcom: *Strategic Review of Digital Communications Discussion document* (16 July 2015), paragraph 1.33 – 1.40.

⁸ See <https://corporate.sky.com/media-centre/news-page/2015/response-to-ofcom-announcement-of-strategic-review-of-digital-communications> and <http://www.talktalkgroup.com/press/press-releases/2015/talktalk-response-to-ofcom.aspx>.

⁹ Ofcom media release, 12 March 2015.

therefore, to re-visit the original analysis in light of experience since Openreach was established as a functionally separate but structurally integrated business within the overall BT Group.

20. BT has commissioned RBB to undertake this review, and has provided us with access to staff at Openreach and BT Group. The review does not set out to deliver an exhaustive appraisal of Openreach's performance. Instead, it offers a high level assessment of the practical consequences of a vertically integrated, but functionally separated, Openreach for investment, competition, and regulation, in the light of the theoretical insights offered by the original 2002 Paper.¹⁰

21. The remainder of this paper is organised as follows:

- In Section 2 we distil some of the insights from the 2002 Paper, in terms of the costs and benefits of vertical integration and the reasons why ownership is important.
- In Section 3 we set out the motivation for functional separation and detail the measures that were put in place in respect of Openreach as a result of BT's 2005 Undertakings.
- In Section 4 we evaluate the implications of a structurally integrated but functionally separated Openreach for investment and competition, drawing on the theoretical insights of our 2002 Paper.
- The impact on regulation is considered in Section 5.

¹⁰ The body of analysis undertaken for this paper was largely completed before Ofcom published its July 2015 Discussion document as part of the Strategic Review of Digital Communications.

2. The benefits and costs of vertical integration – economic insights

2.1. Benefits of vertical integration

22. The 2002 Paper identified a number of potential benefits arising from vertical integration. These benefits are, in many instances, linked to a positive impact on investment and/or the quality of service provision.
23. There is a common explanation for many of these benefits. They arise when actions taken at one stage in the supply chain have consequences for other, vertically-related activities that are not reflected fully in the pricing of arm's length transactions. In other words, the effects of those actions spill over from one level to the other. When the firms that are active at each stage are distinct, these spill-overs also occur between one firm and another along the supply chain. (Economists frequently refer to these spill-overs as "externalities". They are often negative, e.g. when pollution generated by one entity adversely affects others. However, this needn't be the case. Indeed, in many of the cases we consider here, these spill-overs are positive in nature.) Unless an alternative mechanism can be put in place to "internalise" the benefits (or costs) associated with these spill-overs, they are likely to be disregarded when vertically-related but structurally separate firms act in their own, individual interests. In this case, those actions will not take account of, and therefore are unlikely to maximise, the overall benefits either to the parties themselves or to consumers.
24. The so-called double marginalisation problem (as discussed in the 2002 Paper) provides a simple, classic illustration of this. It arises in situations where the market structures at successive stages in the supply chain depart from the textbook model of perfect competition. In this context, firms will price above marginal cost. The basic set-up is one in which an upstream firm sells an input to a downstream firm, which converts it on a one-for-one basis into an output. When the independent downstream firm sets the price of the final good, its aim is to maximise its own profit. In doing so, it balances the attraction of higher unit margins that come with raised prices against the reductions in sales volumes that those higher prices also induce. However, in maximising its own profit, the downstream firm will not take into consideration the margins that the upstream supplier will forego as a result of smaller final good sales.¹¹ Likewise, in pricing the input, an independent upstream supplier will not account for the impact that higher input prices will have on the sales and profits of the downstream firm. In other words, a vertical pricing spill-over arises between the two firms.
25. Vertical integration, by internalising this vertical pricing spill-over and incentivising pricing that takes account of the consequences at both stages of the supply chain, can provide a solution in these circumstances. The outcome is lower prices, which benefits the firms and their customers alike. However, the need for that structural solution turns on the inability

¹¹ In our example, each unit reduction in sales of the final good will also cause a unit reduction in demand for the input.

of the pricing mechanism (or other contractual devices) to address the problem effectively. This issue is addressed further in Section 2.2 below.

26. The 2002 Paper also identified the possibility that vertical integration might also deliver better quality of service. Typically, the service offered by a downstream operator will depend not only on its own efforts but also on the quality of inputs provided by an upstream supplier. Without vertical integration (or equivalent contractual remedies), the upstream supplier will not internalise fully the effects of its actions on the quality of service offered by the downstream operator (since it will not take the impact on the downstream firm's profits into account) and therefore will have diluted incentives to invest in better quality of service.¹² This will be a particular issue when the upstream supplier has a monopoly over an essential input or bottleneck asset, since in that situation a downstream firm which is dissatisfied with the quality of the upstream supplier's service will be unable to threaten credibly to switch to an alternative supplier.
27. Another potential benefit of vertical integration identified by the 2002 Paper is that it can help to address the threat of "hold-up". The hold-up scenario occurs when one firm can appropriate some of the benefits generated by another's investment. This will be the case, for example, where the investing firm must deal with or through a particular trading partner in order to realise the full value of its investments. The essential trading partner will then be in a position to demand a share of those benefits which depend on its cooperation. As with the spill-over scenarios described previously, the investing firm would not, therefore, capture the full benefits of its investment in this case. Anticipating this, its incentives to invest will be diluted. Thus, hold-up threatens the same fundamental under-investment inefficiency as described above, albeit that it occurs as a result of the deliberate opportunism of the essential trading partner in this case. By removing the requirement for such transacting, vertical integration can remove the hold-up threat, thereby de-risking the investment process.
28. Vertical integration can also ensure coordination between upstream and downstream businesses. This will be important where the profits that can be realised by each of those businesses are dependent on them each making a set of mutually compatible decisions, and where each business cannot be certain in isolation what those decisions should be. In this scenario, an integrated decision-making structure may be desirable.
29. Moreover, if one firm is unsure of the actions of the other in a situation where coordination is important, then the expected return from investment, say, will be smaller than it would be if a coordinated outcome was assured. As such, incentives to invest may, again, be undermined, to the potential detriment of consumers.
30. Finally, vertical integration can deliver risk-sharing benefits. As explained in the 2002 Paper, this benefit arises in industries where prices or costs fluctuate significantly and/or

¹² Similar considerations apply with respect to the actions of the downstream operator too.

are prone to large one-off shocks. In such cases, integration can reduce the margin volatility faced by separate upstream and downstream entities.

2.2. Why ownership matters

31. If market transactions could always be relied upon to deliver efficient outcomes then ownership would not be important. Even if not, a solution to the various challenges described above could be achieved without recourse to vertical integration if sufficiently detailed contracts could be agreed and implemented between adjacent business units along the supply chain. However, when market transactions fail and effective contracts cannot be implemented, ownership structure matters.

Ineffectiveness of arm's length market transacting

32. As described above, arm's length market transacting will generate pricing inefficiencies when it results in successive mark-ups over marginal costs.
33. Likewise, the threat of hold-up arises when an upstream input supplier, say, is unable to rely on the rivalry between a plurality of alternative purchasers on the downstream market to secure the full incremental value associated with its efforts and investments. In those circumstances, it will not be able to depend confidently on market transacting to secure reasonable terms for its products or services.
34. Market transacting is liable to fail when the value of an investment is, to a material degree, specific to a relationship with a particular trading partner. Such investment specificity can arise for a number of reasons. For example:
 - the technology involved is only useful when deployed in transactions involving a specific trading partner;
 - the location of the assets in question means that they can only usefully be deployed in trade with one counterparty (The co-location of (so-called 'mine-mouth) electricity generating plants next to coal mines provides a classic example of such locational specificity.¹³); or
 - the scale of the investment may only make commercial sense if trade with a particular (large) counterparty takes place.
35. The last source of specificity listed is worthy of particular comment. If the scale of an investment is justified only if trade with a particular (large) counterparty goes ahead, then part of that investment at least may be specific to that particular trading partner even if it is

¹³ See, for example, Joskow (1985): 'Vertical Integration and Long-Term Contracts: The Case of Coal-Burning Electric Generating Plants', *Journal of Law, Economics and Organization*, and discussion in Section 3.2.1.1 of the 2002 Paper

inherently generic. That would be the case, for example, if additional capacity was built only to serve that customer.

36. Specificity need not be an all or nothing phenomenon, but may, instead, be a matter of degree and depend on the extent to which potential alternative trading partners are able and willing to commit to complementary investment at scale.
37. Importantly, for adverse effects to be avoided in this way, it must be clear at the time that the investment is undertaken, that the investment is sufficiently non-specific for a choice of willing trading partners to materialise. That will be a critical consideration when substantial market uncertainty prevails at the time that the commitment to investment must be made.

Contractual incompleteness

38. Nevertheless, the failure of market transacting to deliver efficient outcomes does not, on its own, imply that integrated ownership is necessary.
39. For example, in theory, a number of different contractual solutions might be deployed to address the double marginalisation problem. So-called two-part tariffs, which would allow the downstream firm to purchase incremental units of input at marginal cost in exchange for a lump-sum payment, constitute one such solution. (Other potential solutions include minimum volume, or quantity forcing, contracts and – subject to legal constraints – resale price maintenance agreements.) In that case, a cost-based unit charge for incremental input purchases would ensure that the downstream firm would internalise the full profit implications of its marginal pricing/output decisions, whilst the lump-sum payment could be used to determine the shares of overall profits secured by the upstream and downstream firms.
40. However, these options will not offer feasible solutions in circumstances where it is not possible to write effective, practically enforceable contracts. In our simple double marginalisation scenario, for example, it would be relatively straightforward to implement some form of two-part tariff. However, agreeing and implementing a practically useful contract is likely to prove much more challenging. Notably, the simplest two-part tariff structure implies that the purchaser will pay the same fixed fee irrespective of demand outcomes. Establishing an appropriate level for that fee may be difficult if outcomes are uncertain. Moreover, in these circumstances, the simplest two-part tariff structure may subject the purchaser to an undesirable amount of profit volatility (as it will imply the same cost irrespective of the margins it earns on unit sales, or the volume of sales made).
41. It will be much more difficult to write and enforce more sophisticated contracts which condition payments effectively on those outcomes. Equally, however, a risk-sharing contract which sets the input charge above costs in exchange for a smaller lump-sum payment will re-introduce the double margin inefficiency. Hence, the challenges faced in establishing effective contracts are likely to multiply quickly where the operating environment becomes more complex and uncertain.
42. At the same time, the challenge of writing watertight, enforceable contracts will only be an issue if any gaps in those contracts would be exploited. That requires that there is (1)

conflict in the individual interests of the contracting parties, and (2) an opportunistic willingness to exploit any loopholes for individual advantage. In that context, contractual incompleteness becomes a problem. Otherwise, broadly-specified promissory agreements would suffice to replicate the benefits of vertical integration.

Ownership solution

43. Ownership becomes a vital consideration when a lack of effective, competitive market transacting, e.g. because of investment specificity, makes the threat of opportunism an issue, and incompleteness is a substantive constraint on contractual solutions.
44. The transaction cost economic literature has highlighted – often in relatively broad terms – the attractions of organising transactions within the boundaries of the firm when the costs of contracting are relatively substantial. More recent work has highlighted, in particular, the critical role of ownership in conferring residual rights of control, i.e. rights of control over the operations of a firm and the returns it generates in circumstances where these have not been ceded contractually to other parties. Those residual rights become relevant when contracts are materially incomplete and, therefore, limited in scope and effectiveness.
45. Vertical integration brings together the residual rights of control over vertically-related assets. That means that the owner can decide unilaterally how and when those assets are used together. This is important when those circumstances are not easily and enforceably described in advance within the terms of arm's length contracts.

2.3. Costs of vertical integration

2.3.1. Transaction costs

46. Vertical integration is not a costless proposition. (If it were, then all transactions would be organised within a single, large firm.) A critical insight of the transaction cost literature, dating back to Ronald Coase's seminal 1937 contribution, is that the boundaries of firms will be shaped by the trade-off between the costs of external contracting, and the (increasing) costs of organising transactions within a firm.¹⁴
47. Notably, some theories identify the impact of integrated ownership on incentives as a source of cost, as well as benefit. According to these theories, it may become more difficult to incentivise some efforts and investments as an organisation expands. The optimal boundaries of the firm are then determined by the trade-off between the incentive and coordination benefits of integrated ownership, on the one hand, and the costs of disincentivised effort on the other.
48. Critically, the choice between vertically integrated and separated ownership structures which maximises the net benefits to the relevant vertically-related parties may not maximise

¹⁴ Coase, R.H. (1937): "The Nature of the Firm", *Economica*, 4 (16): 386–405.

overall welfare. In particular, such a divergence may arise if vertical integration results in foreclosure of rivals' access to markets and thereby undermines the competitive process.

2.3.2. Potential competition and regulatory concerns

49. When a vertically-integrated firm owns and operates an upstream business which supplies its downstream competitors, that firm may have an incentive to supply its own downstream business on preferential terms, at the expense of those competitors. This is most likely to be a concern in an industry where the upstream business operates a 'bottleneck' facility, i.e. one which is relied upon by competing downstream firms.¹⁵
50. In the extreme, an integrated firm might refuse to supply rivals altogether. More generally, the integrated firm may charge competitors higher prices and/or offer them an inferior quality product or service. Both strategies could harm downstream competitors' ability to compete, might bring about foreclosure of those competitors, and could, therefore, put effective downstream competition at risk. In this way, the benefits associated with vertical integration might be offset by inefficiencies.
51. Vertical integration can also make regulation of either the upstream or downstream activity more difficult. Indeed, a classic motivation for vertical integration discussed in the economic literature is the desire to circumvent regulation or other aspects of government policy. This might be accomplished by shifting the allocation of costs from a competitive business to a vertically-integrated, regulated business (where regulation is designed to allow cost recovery) or by transferring profits in the opposite direction, for instance.

¹⁵ Symmetric concerns may arise where the vertically-integrated firm controls access route to a downstream market.

3. Regulatory intervention and functional separation of Openreach

3.1. Regulatory measures designed to prevent foreclosure

52. The EU Electronic Communications Access Directive identifies a number of potential regulatory tools with which to address foreclosure concerns.¹⁶

53. These regulatory tools are:

- *Mandated access to network infrastructure*: Obliging a vertically-integrated operator to provide access to its infrastructure can increase competition downstream. However, allowing other service providers to access facilities that are essential for the provision of competing services needs to be balanced with the rights of an infrastructure owner to exploit its infrastructure for its own benefit.¹⁷
- *Price and/or margin regulation*: Such regulation can prevent an integrated firm from charging downstream rivals prices for inputs that might have the effect of distorting competition on the downstream market. For instance, by tying the price of the upstream division's product to costs, or to the downstream division's prices (via a margin condition), such regulation can prevent the upstream division from leveraging significant market power in the upstream market into the downstream market and, in the process, restricting competition downstream.¹⁸
- *Non-discrimination conditions*: The upstream division can be required to supply downstream competitors on equivalent terms to its own downstream division.¹⁹
- *Transparency*: Transparency of terms and conditions for access can make it more difficult for a vertically-integrated operator to discriminate against downstream competitors and give downstream competitors greater confidence that they are not being discriminated against.²⁰
- *Accounting separation*: Absent accounting separation it may be possible for the integrated firm to apportion an unreasonable proportion of its costs to the (regulated) upstream business, thereby raising the prices paid by downstream rivals and undermining the efficiency-enhancing effect of downstream competition. Where there is effective separation of accounts, this should substantially constrain the scope for the vertically integrated firm to manipulate costs in this manner.²¹

¹⁶ Access Directive 2002/19/EC, as amended by Directive 2009/140/EC, para 14.

¹⁷ *Ibid.*, para. 19.

¹⁸ *Ibid.*, para. 20.

¹⁹ *Ibid.*, para. 17.

²⁰ *Ibid.*, para. 16.

²¹ *Ibid.*, para. 18.

3.2. Functional separation as a regulatory instrument

54. Functional separation entails the creation of an operationally separate upstream business unit whose management has incentives that are aligned with the performance of the upstream business only and whose employees are (generally speaking) prohibited from sharing commercial information with employees in the downstream divisions of the business.
55. The appeal of functional separation lies in a belief that it can reduce the vertically-integrated firm's incentive to foreclose downstream competitors, while preserving the investment efficiencies associated with vertical integration. Thus the Regulatory Framework for Electronic Communications observes that “[f]unctional separation has the capacity to improve competition ... by significantly reducing the incentive for discrimination and by making it easier to verify and enforce compliance with non-discrimination obligations”.²² In other words, it can help to address foreclosure concerns.
56. The Framework states that “[i]n exceptional cases, functional separation may be justified as a remedy where there has been persistent failure to achieve effective non-discrimination ... and where there is little or no prospect of infrastructure competition within a reasonable time-frame after recourse to one or more remedies previously considered to be appropriate”.²³ Functional separation is regarded as somewhat of a last resort, therefore, to be used when standard remedies have demonstrably failed.
57. At the same time, the Framework stresses that “it is very important to ensure that its imposition preserves the incentives of the concerned undertaking to invest in its network and that it does not entail any potential negative effects on consumer welfare”.²⁴
58. In this respect, it is necessary to acknowledge that functional separation will impose additional costs on the firm in question. It must bear the one-off costs of restructuring, including general distraction whilst this process is underway, as well as the recurring costs associated with ongoing compliance.

3.3. Functional separation of Openreach

59. After reviewing the state of fixed telecoms in the UK in its 2004 Strategic Review of Telecommunications, Ofcom said that it “suspect[ed] that competition [was] being restricted in markets for the supply of wholesale access and backhaul network services in the context of electronic communications in the United Kingdom... and on directly related downstream retail markets”.²⁵

²² Directive 2009/140/EC of the European Parliament and of the Council of 25 November 2009, para. 61.

²³ Ibid.

²⁴ Ibid.

²⁵ Ofcom: Notice under Section 155(1) of the Enterprise Act 2002, 30 June 2005, para 1.4.

60. Specifically, Ofcom claimed to have identified “*many examples of products being supplied by BT to its wholesale customers of an inferior quality to those which BT supplies to its own downstream divisions*” and that this had the effect of “*restricting downstream competitors’ ability to construct competitive products in downstream markets*”.²⁶ Ofcom also said that it “*believe[d] that the combination of BT’s enduring market power in upstream wholesale markets, and its vertical integration into downstream markets, may have had the effect of deterring investment by competitors in upstream markets*”.²⁷
61. In order to address concerns about its ability and possible incentive to discriminate against competitors, and thereby avoid a reference to the Competition Commission, BT undertook to loosen the ties between its access division (now known as Openreach)²⁸ and the rest of the BT Group. Specifically, BT committed to the Undertakings, which continue to hold,²⁹ and are centred on two elements, namely: (1) functional separation of BT’s access network; and (2) guaranteed equivalence of inputs (Eol) for competing communication providers.

Separation

62. Functional separation required significant change for a firm that, until then, had been subject to a much more limited “degree of separation”.³⁰ BT’s previously integrated network business was split into an access division (Openreach) and a core network division (BT Wholesale). The former would be responsible for the physical layer assets of the backhaul and access networks; the latter would contain the transmission layer assets of these networks, as well as the core network assets. Openreach would operate independently in the provision of products to downstream customers, including to BT’s own downstream businesses.³¹
63. Functional separation was designed to eliminate any ability and incentive that Openreach might have to afford preferential treatment to BT’s downstream businesses. It was also designed to ensure that BT Wholesale could not discriminate against downstream competitors by virtue of having knowledge of Openreach’s activities and plans to which other communication providers were not privy.³²
64. Openreach was provided with substantial organisational independence. With some exceptions,³³ employees of other BT divisions are not permitted to influence Openreach’s

²⁶ Ibid., paras. 4.19 and 4.20.

²⁷ Ibid., para 4.24.

²⁸ BT also undertook to prohibit (with exceptions) employees of BT Wholesale from sharing commercial information with employees in other divisions (and vice versa).

²⁹ In 2009, significant variations to the Undertakings were agreed between BT and Ofcom. However, these changes had the effect of moving the functional boundaries of BT Openreach and did not revoke or even weaken BT’s commitment to functional separation and the principle of equivalence of inputs. See Ofcom, Variation to BT’s Undertakings under the Enterprise Act 2002 related to Fibre-to-the-Cabinet, 11 June 2009.

³⁰ cf. Martin Cave’s “Six Degrees of Separation”, in Communications and Strategies 64 (2006).

³¹ Ofcom: Notice under Section 155(1) of the Enterprise Act 2002, 30 June 2005, paras 5.31-5.33.

³² Ibid., paras 5.34-5.35.

³³ See Annex 2 of BT’s undertakings.

commercial policy, and the performance-related pay of Openreach's senior management is linked to the performance of Openreach only.

65. Openreach has operational independence too, with a separate annual operating plan and its own capital expenditure budget. In delivering the plan, Openreach is not permitted to act in a way which prioritises the interests of BT's downstream businesses.

Equivalence of Inputs (Eoi)

66. Through a commitment to Eoi, BT undertook to supply products to all downstream firms at the same prices and on the same terms and conditions. This undertaking applies to all products in respect of which BT has been determined to have SMP by Ofcom, including superfast broadband-related products.³⁴ It also applies to requests for changes or enhancements to key inputs. Such requests are addressed by the same Statement of Requirements (SoR) process irrespective of whether they come from within BT or from another communications provider.³⁵ By guaranteeing that downstream competitors have equality of access to upstream products, this undertaking is designed to constrain BT's ability to discriminate against those competitors in ways which might undermine competition.
67. Moreover, to ensure compliance with this commitment, BT was required to put in place an Equality of Access Board (EAB), which is supported by the Equality of Access Office.³⁶ Chaired by a non-executive member of the main BT Group Board and comprising a majority of independent members, the EAB monitors compliance with the terms of the 2005 Undertakings and publishes annual reports on BT's compliance performance.

Retained ownership link

68. However, functional separation of Openreach stopped short of complete ownership separation. As a result, Openreach remains financially integrated into BT Group, i.e. Openreach continues to have access to the capital and cash of BT Group.³⁷ Moreover, functional separation does not eliminate the coordination benefits that vertical integration can bring, or the over-arching ability of the BT Group plc Board to adopt an 'end-to-end' perspective in setting Group-wide strategy. (Ofcom allowed for Openreach's strategic plans to be subject to authorisation by a single board of directors representing BT Group.³⁸) Importantly, the 2005 Undertakings do not prevent the BT Group from operating its downstream businesses in a manner which maximises Group-wide benefits, including benefits which accrue to Openreach.

³⁴ Such products are termed "SMP products" by Ofcom. A product can be classified as a SMP product if, following a review of the market, Ofcom deems BT to have SMP in its provision. For more details, see BT's undertakings.

³⁵ Equality of Access Board: Annual Report 2008, p.28. Note that if a SoR is submitted by a communication provider for an input in which Ofcom has not predetermined BT to have SMP, Openreach is free to accept or reject the request but such processes are nevertheless overseen by the Equality of Access Board to safeguard against undue discrimination (see BT's undertakings, para 5.11).

³⁶ Ofcom: Notice under Section 155(1) of the Enterprise Act 2002, 30 June 2005, para 5.53-5.57.

³⁷ Ofcom: Notice under Section 155(1) of the Enterprise Act 2002, 30 June 2005, para 5.38.

³⁸ Ofcom: Notice under Section 155(1) of the Enterprise Act 2002, 30 June 2005, paras 5.36-5.37.

4. The consequences of a structurally integrated but functionally separated Openreach

69. In Section 2 above we described various economic benefits arising from vertical integration, as well as potential costs, including a concern that integration might be used to distort competition and to undermine regulation. A key insight was the role of ownership in incentivising investment. In Section 3, we explained the concept of functional separation and how the 2005 Undertakings implemented functional separation in the UK so as to facilitate effective enforcement of non-discrimination rules. We now consider the consequences of this regime in practice, focusing on the implications for (1) investment, and (2) competition. The implications for regulation are addressed in Section 5.

4.1. Investment

70. We have identified a number of reasons why, in principle, vertical integration could be expected to facilitate investment in circumstances where contractual solutions could only offer incomplete and therefore imperfect alternatives. In this section, we consider whether the ownership link between Openreach and the rest of the BT Group that was retained by the Undertakings has delivered such investment benefits in practice.

71. We do this in three steps. First, we identify the major investments that have been undertaken by BT since 2005. Second, we consider the incentivising role that can be attributed to the enduring ownership link between Openreach and BT Group. Third, we consider whether a vertically integrated solution was *necessary* to achieve such investment outcomes.

4.1.1. Investment in practice

72. In practice, BT has made some very significant investments, involving both its Openreach and its downstream consumer-facing businesses, in the period since the Undertakings were put in place in 2005. Importantly, downstream efforts to stimulate the take-up of superfast broadband have ensured demand for the enhanced access services put in place by Openreach.

Investment by Openreach

73. BT first announced its plans to invest at scale in fibre-based superfast broadband in July 2008.³⁹ Since then, Openreach has undertaken an extensive upgrade to its access network, investing around £2.5 billion in rolling out fibre to the cabinet (FTTC) and (albeit to a much more limited extent) fibre to the premises (FTTP). This has enabled the provision of superfast broadband (SFBB) services, offering download speeds of up to 80 Mbits per

³⁹ BBC: 'BT to roll out faster broadband', 15 July 2008, available at http://news.bbc.co.uk/newsbeat/hi/technology/newsid_7507000/7507120.stm.

second with FTTC, and over 300 Mbits per second with FTTP.⁴⁰ As a consequence of this investment in fibre technology, Openreach's superfast broadband offering is now available to over 75% of UK households.⁴¹

74. As well as continuing to upgrade its network to fibre, Openreach also plans to start deploying G.Fast technology later this year.⁴² This can enable speeds of up to 1000 Mbits per second.⁴³

Investment by BT Consumer

75. At the same time, BT's downstream consumer-facing business, BT Consumer, has also invested. Most notably, it has become a major acquirer and provider of content in the period since the Undertakings were put in place. Notably, the BT Sport brand was launched in 2013, after BT succeeded in securing the rights to a number of high profile sporting events. In particular, BT obtained the rights to packages of Premier League football matches for the 2013-14 and 2014-15 seasons.⁴⁴ It will continue to show Premier League matches for the next three seasons at least, alongside exclusive rights to Champions League football.⁴⁵
76. BT Sport channels are currently available to BT TV customers, as well as to Virgin TV and Sky TV customers. Customers of BT Broadband who do not subscribe to BT TV can also pay to stream BT Sport channels.

Take up of superfast broadband

77. The benefits of investment in superfast broadband depend not only on the investment itself, but also on consumers taking-up of the services on offer. In this respect, the downstream, end user-facing businesses have a critical role to play in marketing and promoting superfast broadband.
78. It is notable in this respect that take-up of superfast broadband in the UK has increased significantly in recent years and it appears that this trend has continued into 2015. Ofcom's European Broadband Scorecard published in February 2015 reported that the take-up rate of superfast broadband in the UK made it the EU5 country with the highest rate.⁴⁶ Moreover, Ofcom's Communications Market Report 2015 showed that take up of superfast

⁴⁰ See <http://www.superfast-openreach.co.uk/the-big-build/>. Upload speeds are slower.

⁴¹ BT Group: Results for the fourth quarter and year to 31 March 2014, 7 May 2015, available at <http://www.btplc.com/News/ResultsPDF/q415-release.pdf>.

⁴² Ibid.

⁴³ BT Group: 'BT Trials Prove Potential For Ultrafast Broadband Over Copper', available at <http://www.btplc.com/news/articles/showarticle.cfm?articleid=%7B1f647c20-6f61-4e0f-a545-e23443e128ab%7D>.

⁴⁴ See 'Premier League TV deal: Sky Sports break bank to dominate £5.136bn contract' (10 February 2015), available at <http://www.telegraph.co.uk/sport/football/11403761/Premier-League-TV-deal-Sky-Sports-break-bank-to-dominate-5.136bn-contract.html>.

⁴⁵ See 'Champions League: BT Sport wins £897 football rights deal' (9 November 2013), available at <http://www.bbc.co.uk/sport/0/football/24879138>.

⁴⁶ Ofcom: *The European Broadband Scorecard*, 5 February 2015, Figure 5.

broadband in the UK continued to increase, expanding from 23.2% of all UK broadband connections to 30.0% between the end of 2013 and the end of 2014.⁴⁷

79. The evidence suggests that there has been little drop off in that take-up rate. BT reported its best ever performance for fibre connections in the fourth quarter of 2014, with Openreach adding almost half a million premises, either via BT's own retail business or through other communication providers using BT's network.⁴⁸

4.1.2. The benefit of vertical integration

80. In this sub-section, we consider the extent to which on-going vertical integration between Openreach and BT's downstream businesses has contributed to the significant investments described in the previous section. In particular, drawing on the theoretical insights set out in the 2002 Paper and summarised in Section 2 above, we assess the value of vertical integration in underwriting Openreach's commitment to investment in superfast broadband, and the benefits that flow from internalising the spill-overs between upstream and downstream investments. We also assess the counter-argument that integration may have led to under-investment in the access network. In doing so, we also highlight the difficulties undertaking counterfactual assessment of this type.

Hold-up, coordination, and the importance of (BT's) commitment to superfast broadband

81. Once made, the investments in fibre-to-the-cabinet technology which enable superfast broadband provision cannot easily be re-deployed in alternative use. They are committed, irrespective of how quickly or how extensively they are subsequently utilised by communications providers; i.e. irrespective of how rapidly and extensively demand materialises. In contemplating major investment in SFBB, Openreach faced considerable cost exposure, therefore, even if demand for its products did not materialise from communication providers, or materialised with significant delay.
82. The value of the fibre infrastructure put in place by Openreach is derived from the superfast broadband services enabled by that infrastructure. Hence, the value of these upstream investments is only realised once demand for the services offered by downstream communication providers materialises. Importantly, this depends on end-to-end coordination – not only the technical coordination that is a pre-requisite for effective delivery of communication services, but also commercially coordinated investment in the development and marketing of downstream retail services necessary to attract final consumers.
83. Moreover, to the extent that (a tranche of) such demand is specific to a particular communications provider, then the value of Openreach's investments will also be specific to its relationship(s) with the communication provider(s) in question. In these

⁴⁷ Ofcom: Communications Market Report 2015.

⁴⁸ BT Group: Results for the fourth quarter and year to 31 March 2015, available at <http://www.btplc.com/News/ResultsPDF/q415-release.pdf>.

circumstances, the investments are liable to result in dedicated assets, to use Oliver Williamson's terminology, even if the technology itself is not tailored to the needs of a particular customer. In this context, sufficient, credible commitment by communication providers to take up the opportunities provided by investment in fibre was critical if Openreach was to have a viable basis to proceed with such investment without fear of hold-up. Even setting aside the hold-up threat, Openreach would have been exposed to significant cost risk if take-up of relevant services had not coincided with the major investment programme being undertaken.

84. In practice, this critical commitment to superfast broadband was made by BT Group. It essentially underwrote the investment made by Openreach. In turn, that commitment was underwritten by the vertically-integrated BT Consumer business, which took on the role of 'anchor tenant'. Significantly, the terms of the 2005 Undertakings have also ensured that all communication providers have subsequently benefitted from this commitment, being entitled to the same access as BT itself to the superfast broadband services delivered by the investment that has resulted.

Complementarity, spill-overs, and enhanced investment incentives

85. Where investments and other marketing efforts by BT Consumer will also stimulate demand for the services offered by Openreach, most notably broadband, then a vertically integrated BT Consumer can be expected to undertake more investment than a separated entity would. This is because BT, as owner of both the BT Consumer and Openreach businesses, will internalise the positive impact of expanded BT Consumer sales on the profits earned by Openreach.
86. Similarly, and subject to relevant margin squeeze conditions, BT can be expected to take account of the additional margin which Openreach will generate as a consequence of any expansion in BT Consumer's subscriber base when setting prices for the latter's products. In effect, integration in this context addresses, at least partially, the spill-over inefficiencies identified in the 2002 Paper.
87. There are a number of different ways in which this stimulus might take effect, driven by complementarity between the broadband and content offered by BT. Most directly, investment in the sport and other content offered by BT Consumer might bring about increased demand for superfast broadband from customers who wish to access that content online. More generally, take-up of Openreach's services will be encouraged by the bundled pricing deals marketed by BT Consumer; notably, the offer of BT Sport content at reduced prices to those consumers that also subscribe to BT's broadband services. Such package deals are likely to encourage additional demand for Openreach's broadband services that would not have materialised otherwise. Even without such packaged pricing deals, the BT Sport offer might be expected to attract demand to BT Consumer's services generally, including broadband, via the 'one-stop-shop' attractions of obtaining services from a single source.
88. In principle, symmetric arguments apply in respect of the investment and pricing decisions made by Openreach too. For instance, to the extent that the availability of cheaper upstream broadband access would bring about a profitable stimulus to demand for BT

Consumer's services, by enabling a reduction in retail prices, then a vertically integrated Openreach might be expected to set lower prices than a fully separated upstream entity.

89. An equivalent logic applies to non-pricing aspects of service too. Thus, integration would provide Openreach with enhanced incentives to introduce new or better quality services, and to do so more rapidly, where this will allow a boost to the downstream business' retail proposition.⁴⁹
90. In practice, regulation limits somewhat these advantages of vertical integration. Specifically, the 2005 Undertakings themselves are designed to temper the incentives and ability of Openreach to respond to the economics of vertical integration. Nevertheless, we understand that there is scope within the terms of the Undertakings for BT Group to shape the broad strategic direction taken by Openreach, provided that the equivalence of Openreach's treatment of all communication providers is preserved.
91. In summary, to the extent that there is complementarity in the demand for the services offered by Openreach and the services offered by BT Consumer, integrated ownership can be expected to stimulate enhanced investment in both businesses. At the same time, the extent to which these potential benefits of vertical integration can be realised in practice will be limited by the regulatory constraints imposed on Openreach.

An under-investment concern?

92. At the same time, as noted in Section 2, some theories of integration and the optimal boundaries of the firm have suggested that integrated ownership may result in costs as well as benefits in terms of incentives for effort and incentives. These theories are not straightforwardly applied to large corporate entities such as BT Group. However, according to the spirit of those theories, Openreach's investment incentives might be *diminished* within a vertically integrated BT, compared to a situation where it was entirely vertically separated. That could be the case if investment priorities within BT Group were focused on the downstream business, i.e. on BT Consumer's activities.
93. Detailed evaluation of this specific issue is beyond the scope of this paper. However, if vertical integration deprived Openreach of capital which would have been available to a separated business, then the resulting adverse effects would need to be balanced against the benefits – such as those articulated above. On the other hand, if vertical integration has provided Openreach with enhanced access to the capital required to finance investment in superfast broadband, then any concern falls away.
94. Similarly, if there was evidence that integration had led to diminished management effort within Openreach, these adverse effects would have to be balanced against the benefits of vertical integration.

⁴⁹ The availability of superfast broadband may expand the range of interactive services that can be offered in conjunction with content, for example.

95. In a recent paper, Redburn has suggested that the ownership ties which Openreach retains with the rest of BT Group have resulted in underinvestment in Openreach's network infrastructure.⁵⁰ More specifically, the authors speculate that the launch of BT Sport – and the subsequent investments in Premier League broadcasting rights in particular – diverted funds from Openreach that would otherwise have been invested in its network. The authors cite a trend of falling annual capital expenditure by Openreach and a claimed lack of investment in fibre-to-the-premise (FTTP) in support of this view.
96. In practice, after netting off public funds provided by Broadband Delivery UK, Openreach's share of BT Group's capex increased in every year between 2009 and 2014, when there was a small decrease.⁵¹ Hence, it is not evident that BT has been shifting resources away from Openreach at the expense of its network. Moreover, evidence that BT Consumer remains profitable in its own right, despite extensive investment in sports rights, is also relevant in this respect.⁵²
97. It is far from obvious either, in this context, that investment in additional FTTP deployment would be efficient at this time. Indeed, a number of analyst reports have argued to the contrary.⁵³

Counterfactual analysis

98. A definitive assessment of the role of integrated ownership in incentivising investment by BT, notably in superfast broadband, would necessarily involve comparison of investment outcomes given a vertically integrated structure with outcomes under conditions of separation. By definition, the latter are not observable in the present case. In other words, counterfactual analysis is required. Specifically, some form of proxy for the outcome absent vertical integration is needed.
99. International comparisons offer a source of potential benchmarks. According to Ofcom's European Broadband Scorecard, the UK was ranked first among the "EU5" countries (France, Germany, Italy, Spain and the UK) in terms of superfast coverage in 2013.⁵⁴ Moreover, Ofcom has also reported that the UK's superfast broadband coverage has increased at a faster rate than in the other EU5 countries.⁵⁵
100. However, limited insight into this issue can be obtained by comparing outcomes in the UK with those in countries that also have vertically integrated access providers. Rather, such comparisons would seem to offer a measure of the impact of the particular form of

⁵⁰ Redburn: *Cutting the Gordian Knot: The Break-up of BT*, Thinking Allowed, March 2015.

⁵¹ See BT Annual Reports.

⁵² See Citigroup: *Open Breach – The Wrong Medicine*, 23 March 2015, p.6.

⁵³ See, for example, Citigroup: *Open Breach – The Wrong Medicine*, 23 March 2015 and HSBC: *War & Pieces – rivals demand the structural separation of BT*, 17 March 2015.

⁵⁴ The superfast broadband service provided by Virgin Media via its cable network, and which were available to 44% of premises nationwide as of June 2014, also contribute to overall coverage.

⁵⁵ Ofcom: *The European Broadband Scorecard*, 5 February 2015, pp.13-14. Further, over 95% of UK households have access to broadband of some kind. Due to significant differences between the 28 EU Member States in terms of factors that affect the development of broadband – such as geography, population size and density – Ofcom considered it more appropriate to compare the UK's broadband performance with those in other major European economies rather than with those in all 28 EU Member States.

functional separation implemented in the UK. Nevertheless, this lack of counterfactuals itself indicates that an integrated structure has overwhelmingly been chosen as the preferred organisational form by network operators internationally.

101. New Zealand offers one clear-cut case where full structural separation of the upstream network access provider has occurred at scale. In 2011, the vertically-integrated network provider – Telecom – was effectively forced to spin off its local network access division, Chorus, from its downstream businesses, in order to participate in the government-funded roll-out of “ultra-fast broadband” (UFB).⁵⁶
102. Investment in UFB in New Zealand began in December 2010. It is intended that 75% of New Zealand households will be able to access the service, which is designed to provide a fibre to the premises capability allowing download speeds of up to 100 Mbits per second, by 2019.⁵⁷ As part of that roll-out, Chorus is contracted to deliver UFB passing around 800,000 premises in total.⁵⁸ As of the end of 2014, it had passed around 312,000 premises (approximately 38% of the target), of which around 47,000 (15%) had taken up fibre connections.⁵⁹
103. At first sight, the limited evidence available from the New Zealand experience of structural separation does not suggest that it has brought decisive advantages in terms of the speed of investment roll-out or take-up. Nevertheless, considerable caution is required in drawing inferences from such high level comparisons, since other important influencing factors are liable to vary between countries and could explain observed differences in performance.
104. Most notably, the solution in New Zealand involves fibre to the premises, and it is heavily subsidised by government funding. While some public funds have been available in the UK too, BT has financed much of the roll-out of superfast broadband itself. As such, the New Zealand experience cannot answer the question of whether a separated ownership structure would be most likely to deliver, or even be capable of delivering, timely commercial investment in superfast broadband. Rather, it would seem to provide potential evidence (albeit still somewhat untested) of government intervention offering an alternative solution to the problems posed by uncertainty and imperfect commercial contracting.

4.1.3. The need for an ownership tie

105. We have explained how BT Group’s commitment to fibre-based superfast broadband appears to have had a critical influence on the decision to go ahead with the necessary investment. BT Group’s willingness to underwrite that investment was essentially underpinned by a view of likely future end-user demand for superfast broadband services that would have been informed by the market perspectives of BT Group’s own consumer-facing retail business. Nevertheless, if a similar commitment would have been forthcoming from a fully separated BT, and would have had equal value to Openreach, then the resulting

⁵⁶ See <https://www.chorus.co.nz/about-chorus/our-history/our-history>.

⁵⁷ See <http://www.crownfibre.govt.nz/getting-ufb/rollout-timetable>.

⁵⁸ See https://www.chorus.co.nz/ufb#/undefined?&_suid=14364480355990673073641262198.

⁵⁹ *Ibid.*

benefits could not be attributed to the retained ownership link between Openreach and the other parts of the BT Group.

106. As we have explained, we think that this would have required some form of contractual commitment by a separate BT Group. However, in practice, in a world in which arm's length contracts are very likely to be incomplete and imperfect, we do not believe that the vertically integrated BT Group's commitment to superfast broadband would have been replicated via contractual means.

107. That is especially true given the uncertainty concerning demand for superfast broadband that existed at the time investment was committed. In its September 2005 Final Statement on the Strategic Review of Telecommunications, for instance, Ofcom observed that:

*"there was a dichotomy in attitudes to next generation access among stakeholders. On the one hand, most consumer and business organisations, many public sector bodies, many IT companies and equipment manufacturers argued that rapid deployment of this infrastructure was critical to the competitiveness of the UK's economy, the future delivery of public services, and many other societal benefits. On the other hand, most telecoms network operators said that they saw no business case for a substantial upgrade of the access network even in the medium term, and that there was plenty of scope left to deliver higher speeds from the existing copper infrastructure".*⁶⁰

108. Ofcom also recognised that this uncertainty had significant implications for the risks to which those contemplating investment in fibre-based, "next generation" access would be exposed. Thus, in the Final Statement on the Strategic Review of Telecommunications, Ofcom also noted that:

*"investments in next generation access networks will be subject to more significant demand-side risk than core network upgrades. Core network transmission capacity can be upgraded incrementally once the fibre has been laid and in response to known demand. However, providers of next generation access infrastructure would only have a clear idea of demand once they had incurred a very significant upfront sunk cost".*⁶¹

109. As well as making it more difficult to contract at arm's length in the first place, such uncertainty implies substantial exposure to underlying market volatility and therefore risk from incomplete or simplistic contractual arrangements.

110. In addition, as the 2002 Paper observed, the dynamic, evolving nature of telecoms, as well as the need for instantaneous end-to-end connectivity, sets it apart from many other utilities in terms of the complexity of the coordination required. Such complexity makes effective long-term contracting a much more challenging proposition.

⁶⁰ Ofcom: *Final statements on the Strategic Review of Telecommunications, and undertakings in lieu of a reference under the Enterprise Act 2002*, 22 September 2005, paragraph 6.15.

⁶¹ *Ibid.*, paragraph 6.13.

4.2. Competition

111. As highlighted in Section 2, the principal concerns with vertical integration are that it will lead to foreclosure of competitors, thereby undermining competition in non-bottleneck parts of the supply chain. In the present context, such concerns focus around equivalence of access to existing Openreach products, as well as the development of new products by Openreach.
112. Specifically, concerns would arise if BT's downstream rivals that rely on access to Openreach products to compete were not able to obtain such access on equivalent terms to BT and were unable to compete effectively as a result. Similarly, concerns would arise if the process of developing new or adapted products within Openreach favoured BT's downstream operations at the expense of rivals.
113. However, the Equivalence of Input (Eol) conditions which were at the heart of the 2005 Undertakings, and apply to Openreach's relationships with BT's downstream competitors such as Sky and TalkTalk, were specifically designed to address and eliminate such concerns. They require that all communications providers are treated identically by Openreach.
114. A critical test of the effectiveness of the Eol condition at the time the Undertakings were introduced was its role in underpinning the Local Loop Unbundling (LLU) process, whereby BT's competitors are able to install their equipment in BT exchanges and lease the local loop between the exchange and a customer's premises. By the end of 2013, over 95% of premises were connected to unbundled exchanges, and 27.7% of the UK's fixed lines – over 9 million lines in absolute terms – were provided using LLU.⁶² This compares with just over 100,000 unbundled lines in 2005, when the Undertakings came into effect. Ofcom has itself observed that “[t]he spur for the surge in unbundled lines was [the] set of legally-binding Undertakings that Ofcom agreed with BT Group”.⁶³
115. The Equivalence of Input provisions also extend to the development of new products, via the Statement of Requirements (SoR) process. Whenever a communications provider desires a change to an access product which Openreach is obliged to provide as a result of an SMP finding, the communications provider's request is subject to the same process irrespective of whether the provider is part of the BT Group or a downstream competitor. If the change promises to increase economic efficiency (in particular, by reducing forward-looking economic costs), Openreach is obliged to provide the product – again regardless of whether the source of the request is BT or the competing communication provider.⁶⁴
116. Had Openreach been focused unreasonably on developing access solutions which favoured BT's own downstream business (albeit that those solutions would be made available on Eol terms to all communications providers), then we might have expected to

⁶² Ofcom: *Communications Market Report 2014*, p. 327.

⁶³ See <http://ask.ofcom.org.uk/help/telephone/LLU>

⁶⁴ See, for example, Ofcom, *Dispute between TalkTalk and Openreach relating to single jumpered MPF*, 15 November 2013, paras 1.9-1.12.

see rivals trying to make greater use of the SoR process, and/or complaining at its outcomes. In practice, we understand that very few complaints have been made to the EAB regarding the SoR process, and none of these have been substantively upheld. That does not suggest an environment in which rivals are being denied the new access solutions required to compete with BT.

117. Importantly, even if integration had resulted in additional, desirable investment that was wholly BT-specific, this should not give rise to concern unless it had crowded out investments which would have benefitted rivals, and consumers were made worse off as a result.
118. The competitive reality that has resulted from this process is that BT faces three major rival suppliers of retail fixed broadband – Virgin Media, Sky, and TalkTalk – as well as a number of smaller competitors. Whilst BT was the largest single retailer as of the end of 2014, accounting for 32% of connections, Sky had a 22% share, Virgin Media 20%, and TalkTalk 14%, with the remaining 12% held by other providers.⁶⁵ Significantly, therefore, BT's retail rivals accounted for more of the connections provided by Openreach than BT itself.⁶⁶ Moreover, Virgin operates its own access network. It would be surprising if this market structure provided the backdrop to a serious foreclosure problem.
119. With regard to superfast broadband, Virgin Media remains the largest provider, albeit that BT's share of connections has increased since mid-2012, and seems likely to grow further as it rolls out fibre beyond Virgin Media's network footprint. Importantly, the EoI process means that Openreach's large-scale roll-out of superfast broadband-enabling fibre access is available to all communications providers on equivalent terms. Neither Sky nor TalkTalk appears to have focused much marketing effort on these services initially, however, preferring instead to concentrate on 'standard' broadband services. Nevertheless, the share of superfast broadband subscriptions held by BT competitors other than Virgin doubled, from 5% to 10%, between Q1 2013 and Q1 2014. Ofcom observes that "[t]his is probably the result of increased marketing activities by Sky, TalkTalk and EE".

⁶⁵ Ofcom: Communications Market Report 2015, August 2015, "Facts and Figures".

⁶⁶ BT accounts for a smaller proportion of fixed broadband connections than any other 'EU5' incumbent. (See Ofcom: The European Broadband Scorecard, December 2014.

5. Impact on regulation

120. Another argument put forward for further, structural, separation of Openreach is that it would make regulation easier and/or less costly for Ofcom; for example, by eliminating the need for intervention to prevent foreclosure of rivals in the competitive downstream market. However, it is not evident to us that there would be a substantial reduction in the requirement for regulation if ownership of Openreach was separated from BT's downstream operations.
121. To the extent that even a separated Openreach would possess market power in respect of the provision of access services, including for superfast broadband, it seems likely that some form of continuing regulatory oversight of its activities would be deemed necessary. It is not evident to us that the requirements of such regulation, and the costs it would entail, would be substantially diminished, even if Openreach were fully separated from BT.
122. Whilst some regulations, such as those implementing accounting separation, might not be required under separated, standalone ownership, for instance, it does not follow that this would deliver substantial cost savings, since separate accounts would have to be produced anyway for a standalone Openreach. In fact, if Openreach was merged into another entity – even a vertically-unrelated one – it seems likely that separate accounts would continue to be required so long as intensive ongoing regulatory scrutiny of Openreach was deemed necessary.
123. In any event, the costs associated with the current EoI regime – such as the operation of the EAB – are largely borne by BT. To the extent that regulation is effective and BT continues to bear the additional costs associated with functional separation, then it is reasonable to suppose that these additional costs are outweighed by the benefits of continued integrated ownership. If not, and the costs of integrated ownership (including the costs of additional regulation) exceeded the anticipated benefits, then BT could be expected to de-merge Openreach voluntarily.
124. It has been suggested that a structurally separate Openreach would have greater incentives to improve quality of service than the BT-owned entity.⁶⁷ However, although we are aware that quality of service issues have been a subject of concern, it is not clear to us why this conclusion should follow. Indeed, there are good reasons – as described in Section 2 above – why a vertically integrated provider would have stronger incentives to invest in quality than a standalone firm. Moreover, the requirement that Openreach treats all its customers, including BT's downstream rivals, equivalently means that benefits from BT's continued ownership of Openreach are also made available to competitors on equivalent terms.
125. The notion that regulation could simply be removed because a vertically-separated Openreach would no longer have an incentive to discriminate among customers is also miss-placed. So long as such incentives might be restored (even imperfectly) through

⁶⁷ See, for example, <http://www.talktalkgroup.com/press/press-releases/2015/talktalk-response-to-ofcom.aspx>.

contracting, continued regulatory oversight would seem likely to be required. Moreover, a residual desire to oversee the level of charges generally is likely to remain.