Ofcom's Strategic Review of Digital Communications: *"Strengthening Openreach's strategic and operational independence": Proposal for comment*

A review of CRA's '*The hold-up problem in vertically-related industries*'

4 October 2016

Strictly Confidential

Contents

Section 1

Introduction

Context

1.1 On 5 June 2015, Sky submitted a paper by CRA to the DCR consultation: "The 'Hold-Up' Problem in Vertically-Related Industries: An economic analysis" ("the CRA Paper").

1.2 The CRA Paper seeks to draw insights from the theoretical and empirical literature, from a stylised theoretical model and from selected industry case studies to (a) identify the market circumstances in which hold-up problems are more likely to arise, and (b) to compare the performance of contractual arrangements and vertical integration as means to address hold-up problems.[1]

1.3 The final section of the CRA Paper then seeks to "*use the main insights from the theoretical and empirical literature to briefly consider claims that the separation of BT's network and retail arms would create insurmountable hold-up problems*".[2]

Instructions

1.4 We have been asked by BT to review the CRA Paper.

1.5 It is beyond the scope of this paper to provide a comprehensive critique of every point raised by the CRA Paper. We have restricted our attention to what we consider to be the CRA Paper's most fundamental propositions and claims.

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1 CRA Paper, page 1.

2 CRA Paper, page 3.

Preliminary observations

1.6 Before proceeding with our review of the CRA Paper, we make two preliminary observations on the relevance of the CRA Paper in the broader context of Ofcom's consultation and proposals for reforming the relationship between BT Group and Openreach.[3]

1.7 First, the CRA Paper's analysis is narrow and incomplete with respect to the question faced by Ofcom. As we discuss in a separate paper ("An economic analysis of Ofcom's concerns and proposals", henceforth the "CL main paper"), the risk of introducing hold-up problems is only one of a number of potential costs of further separation of Openreach from BT Group. These include not only the costs of transitioning from the *status quo,* but also the loss of important efficiencies made possible by vertical integration[4], such as cost synergies, the removal of double marginalisation and other coordination benefits.[5] As noted in the CL main paper, Ofcom has previously recognised that structural separation would carry substantial costs.[6]

1.8 The CRA Paper is concerned only with the specific issue of hold-up and is therefore incomplete with respect to evaluating the totality of the risks and costs of further separation of Openreach. Hence, even if the CRA Paper succeeded in establishing that there was no risk of further separation of Openreach from BT Group giving rise to hold-up problems (which, for the reasons set out below it does not), this would necessarily be insufficient to

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3 Ofcom, Strengthening Openreach's strategic and operational independence: Proposal for comment, 26 July 2016 ("The Openreach Consultation").

4 Vertical integration refers to upstream and downstream activities in a supply chain being brought under common ownership and control. Forward integration occurs when an upstream firm (e.g. a manufacturer or supplier) acquires ownership and control of a downstream firm (e.g. a distributor or buyer). Backward integration occurs in the opposite direction, i.e. where a downstream firm acquires ownership and control of an upstream input supplier. Vertical integration in either direction can arise through new investment (i.e. internal growth) or through mergers and acquisitions of existing firms.

5 CL main paper, paragraphs 5.36-5.46.

6 CL main paper, paragraphs 1.8 and 5.19. Ofcom, Making communications work for everyone: Initial conclusions from the Strategic Review of Digital Communications, 25 February 2016 ("Ofcom's Initial Conclusions"), paragraph 6.61.

determine whether Ofcom's proposed intervention was economically justifiable.

1.9 Secondly, there is a clear tension between the CRA Paper's argument that hold-up is mitigated by downstream competition (which, for reasons discussed below, is flawed) and Ofcom's 'strategic discrimination' concern.

1.10 The CRA Paper's argument that hold-up is mitigated by downstream competition rests on the assumption that Openreach investments are of at least some 'common utility' to downstream firms.[7] Without some commonality in the utility of the investments there would be no scope for Openreach to 'play customers off against each other' to reduce its risk of hold-up in the manner suggested by the CRA Paper. On the other hand, Ofcom's presumption that strategic discrimination is possible and justifies a remedy *requires* investments to have a degree of specificity to individual downstream buyers. As set out in the CL main paper, in circumstances where Openreach's investments are of common utility to all downstream firms we do not consider that Ofcom's concern about strategic discrimination arises.[8] As a corollary, in the circumstances where Ofcom's strategic discrimination concern does apply, the hold-up problem *is* likely to arise, contrary to the claims in the CRA Paper.

1.11 Moreover, even if most of the investments undertaken by Openreach were not fully specific to individual customers (which seems likely in respect of the investments of interest in this case, i.e. infrequent and long-duration investments that "shape the network"[9]), such that the standard hold-up problem addressed in the CRA Paper did not arise, underinvestment (i.e. hold-up) problems could nonetheless arise if Openreach was further separated from BT Group for at least two reasons.

a. *Ex ante* differentiation. Even in circumstances where Openreach's investments are of common utility *ex post* it may be subject to hold-up where downstream customers have differing preferences for alternative

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7 See paragraph 3.19 below.

8 CL main paper, paragraphs 4.31-4.44.

9 See paragraph 3.28 below.

investments *ex ante* and where Openreach requires up-front commitments from customers to make an investment. Where downstream customers have differing preferences over Openreach's choice of investment they will be reluctant to make an up-front contribution for fear that, having made a contribution on the understanding that Openreach would select the investment that they prefer, Openreach will solicit contributions from their rivals and instead choose the investment that was preferred by the rivals. As a result, none of the downstream firms contributes to the investment and Openreach is held-up. Alternatively, having agreed with a particular downstream customer to select the investment that it prefers on the basis that that customer will make a given contribution towards the investment, once Openreach sinks a portion of the investment the downstream customer will seek to renegotiate downwards its contribution in the knowledge that other customers have a lower valuation of the investment choice and that Openreach will incur further costs to change its investment choice to one that was preferred by other customers. Conscious of these risks, a vertically separated Openreach will be held-up and will underinvest.

b. Equivalence of inputs ('EOI') and free-riding. Hold-up problems might also arise even where the investments do not benefit any particular downstream communications provider ('CP'). To illustrate why consider a scenario where a separate Openreach has the opportunity to invest in a project that benefits all CPs equally, but such investment cannot be undertaken profitably unless it is co-funded by the CPs. Openreach may be held up by customers who seek to renegotiate their *ex ante* agreements (which promised a certain financial contribution to fund the investment) in order to free-ride on the funding commitments made by other customers. Openreach would be constrained in its ability to combat free-riding because its EOI obligations would prevent it from withdrawing supply from customers seeking re-negotiation (in order to free ride). Knowledge of these risks would tend to undermine Openreach's investment incentives compared to a scenario in which upstream and downstream interests were aligned through vertical integration. A contractual solution would involve CPs making their contributions prior to Openreach's investments. In other words, they should be prepared to contract on Openreach's investment. This is unlikely, however, to be a

realistic option, because of a range of complexities involving in writing effective, enforceable contracts, which are described in paragraphs 5.11 and 5.12 below.

Credentials

1.12 The academic credentials and experience of the authors of this paper can be found at the links provided below:

a. Neil Dryden: http://www.compasslexecon.com/professionals/bio?id=209.

b. Jorge Padilla: http://www.compasslexecon.com/professionals/bio?id=211.

c. Andrew Swan: http://www.compasslexecon.com/professionals/bio?id=6411.

Statement of truth

1.13 We have prepared this report on the basis that our duty is to help on matters within our expertise. We are independent from the parties and their legal advisors. The assumptions upon which our opinions are based are not, in our opinion, unreasonable or unlikely assumptions.

1.14 We confirm that we have made clear which facts and matters referred to in this report are within our own knowledge and which are not. Those that are within our own knowledge we confirm to be true. The opinions we have expressed represent our true and complete professional opinions on the matters to which they refer.

Section 2

Summary

The CRA Paper presents an incomplete and unbalanced summary of the theoretical literature that is at odds with standard presumptions

2.1 The CRA Paper claims that the theoretical literature provides a general presumption that the efficiency benefits of vertical integration are likely to be small relative to its anticompetitive effects and therefore that contractual solutions to address hold-up problems should be preferred because these solutions allegedly can deliver the same efficiencies but without the anti-competitive effects.[10] We consider this position to be at odds with the standard presumptions set out in the literature, in authority guidelines and case precedent, and in views expressed by CRA in other contexts that vertical integration is more likely than not to be efficient and only rarely to give rise to a material risk of anticompetitive foreclosure.

2.2 The analysis in the CRA Paper of the market circumstances affecting the severity of hold-up is incomplete and ignores key insights that contradict the paper's hypotheses. In particular, the CRA Paper's analysis of the effect of downstream competition on the severity of hold-up ignores (i) the constraints that Openreach's EOI obligations impose on its ability to discriminate between customers in the manner the CRA Paper suggests would mitigate hold-up, or (ii) the insights offered by the Coasian dynamics literature which shows that hold-up can be more severe when an upstream firm faces multiple downstream counterparties (i.e. in the circumstances that would be faced by Openreach absent its EOI obligations).

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10 See, for example, CRA Paper, pages 2 and 11-12.

The CRA Paper seeks to draw general conclusions from a highly stylised and specific model that is not fit for the task

2.3 The predictions of the theoretical model presented in the CRA Paper are inconsistent with the standard presumptions set out in the literature and with more recent theoretical work, and the assumptions on which it is based fail to capture salient features of the case at hand (i.e. an integrated firm facing multiple non-integrated downstream customers). Accordingly, we consider the model presented in the CRA Paper to be of limited probative value, in general and in the specific context that is relevant in this case.

The CRA Paper does not offer any meaningful comparison of the relative merits of vertical integration and contractual arrangements as solutions to the hold-up problem

2.4 The CRA Paper argues that, although vertical integration can solve hold-up problems, it always involves the risk of anticompetitive foreclosure and may also involve other costs (e.g. by introducing principal-agent or moral hazard problems).[11] Accordingly, contractual solutions to hold-up, which do not involve the risk of foreclosure (or any other costs that are identified in the CRA Paper) should be preferred. We consider this argument to be fundamentally flawed in a number of respects.

2.5 First, as discussed below[12], vertical integration does not always give rise to a risk of foreclosure – on the contrary, economic theory and evidence suggest this risk is low, and the strict conditions under which it can arise are rarely satisfied.

2.6 Secondly, the CRA Paper ignores the fact that contracts can also be used to foreclose competition – the substitutability of vertical integration and vertical agreements in this regard is clearly recognised in economic theory and evidence, and as a matter of competition policy. On the contrary, vertical

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11 See paragraphs 3.8-3.13 and 5.1-5.4 below.

12 See paragraph 3.8 *et seq.* below.

mergers are typically treated more leniently than vertical restraints because of the larger efficiencies they are expected to generate.[13]

2.7 Thirdly, the CRA Paper fails to recognise or consider the costs of designing and enforcing contracts to address hold-up – particularly in circumstances where the economic environment is uncertain, the investments have long lead times and lives, and the contractual arrangements are necessarily complex (as is the case for the relevant telecommunications markets), contracts may fail to address hold-up problems efficiently or at all. Indeed, the hold-up problem is defined by contractual incompleteness.

2.8 Fourthly, the CRA Paper does not consider the extent to which the contractual arrangements it identifies are likely to be (i) effective in addressing hold-up or (ii) to be immune to anticompetitive effects, either in general or in the specific circumstances of this case.[14] Moreover, as discussed in section 8, the CRA Paper has failed to consider that the contractual mechanisms it identifies are likely to be incompatible with Openreach's regulatory obligations to provide access to its infrastructure on open and non-discriminatory EOI terms (or the implications for competition and investment that a relaxation of these obligations to accommodate the mechanisms proposed would involve).[15]

2.9 By failing to address these fundamental issues, the CRA Paper offers no meaningful insights into the relative merits of vertical integration and contractual arrangements, whether as means to address hold-up or more generally.

The CRA Paper downplays the findings of the cross-sectional empirical literature on the basis of unfounded methodological concerns

2.10 The CRA Paper acknowledges that the cross-sectional empirical literature provides strong support for the efficiency of vertical integration as a solution

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13 See paragraph 5.9 below.

14 See paragraphs 5.14 *et seq*. below.

15 See CL main paper, paragraphs 5.13-5.16.

to hold-up but seeks to downplay these findings on the basis of methodological concerns.

2.11 However, the CRA Paper's assessment of the severity of these methodological concerns is at odds with more balanced and objective evaluations,[16] which find these concerns insufficient to overturn the well-established empirical findings in favour of the efficiency of vertical integration as a solution to hold up.

The CRA Paper's case studies are not informative of the relative merits of vertical integration and contractual arrangements as means to address the risk of hold-up, either in general or in the context of Openreach

2.12 The CRA Paper's analysis of various industry case studies is flawed in a number of respects.

2.13 First, we consider it surprising for the CRA Paper to draw clear conclusions in favour of its hypothesis from the GM-Fisher Body example given the ongoing disagreement in the literature on the appropriate interpretation of the facts in that case.

2.14 Secondly, the CRA Paper does not clearly identify the source and extent of the hold-up problems in the cases it considers. Hence, the observation that there are contractual arrangements between vertically-related firms in some cases is uninformative of the relative effectiveness of contracts compared to vertical integration for addressing hold-up more generally. Put simply, the CRA Paper has not established that the case studies it cites are of any general relevance, nor that they provide a reasonable or informative benchmark for possible arrangements in telecommunications markets.

2.15 Thirdly, in a number of the examples discussed by the CRA Paper the solutions to the supposed risk of hold-up would appear to resemble vertical integration more closely than they do contractual arrangements.

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16 Including by the authors of the very same empirical surveys from which the CRA Paper draws.

2.16 Fourthly, and perhaps most tellingly, the CRA Paper makes no reference to other telecommunications markets in its case studies, in which markets vertical integration is pervasive and, research suggests, efficient.

The CRA Paper's application of theory and evidence to the case of Openreach ignores the relevant context and is in tension with Ofcom's concerns and proposals

2.17 The CRA Paper provides no compelling reasons or evidence to doubt that hold-up concerns would arise in the event that Openreach was structurally or further functionally separated from BT Group.

2.18 First, for reasons set out above and in section 3 below, the insights drawn on by the CRA Paper to assess the effects of various market circumstances on the extent of hold-up are erroneous or incomplete, and its application of these insights therefore uninformative of the extent of hold-up problem that would be faced by a more separated Openreach. In any event, we consider the CRA Paper's assessment of the market factors it considers relevant in the context of the Openreach to be deficient in a number of respects. In addition, the CRA Paper fails to recognise that even if the investments of interest are of low specificity, vertical separation could nonetheless give rise to investment hold-up due to the loss of commitment and coordination between the vertically-related entities.

2.19 Secondly, although the CRA Paper claims that any "residual" hold-up problems that would be faced by a more separated Openreach can be solved by contracts, it has not undertaken a meaningful assessment of the practicalities, competitive consequences, and regulatory compatibility of the contractual solutions which are suggested. In particular, the CRA Paper does not (and indeed cannot) show that the contractual solutions that it identifies would (i) address Openreach's hold-up risk as effectively as forward integration[17]; (ii) prove less restrictive of competition than forward integration; or (iii) be compatible with Openreach's existing regulatory obligations, in particular its obligations to provide open and non-discriminatory access on

[17] As noted in footnote 4 above, forward integration refers to an upstream firm (e.g. a manufacturer or supplier) acquiring ownership and control of a downstream firm (e.g. a distributor or buyer).

EOI terms (or, if such a regime was relaxed, be compatible with Ofcom's objectives to promote competition).

2.20 In any event, as noted above and discussed in the CL main paper, even if the CRA Paper succeeded in establishing either that there was no material risk of hold-up in the event of a more separated Openreach, or that whatever risk of hold-up existed could be equally well addressed by contractual arrangements as by vertical integration (which we consider it has not), this would be insufficient to conclude that vertical separation could not have adverse effects on Openreach's incentives to invest given the additional costs and risks that further separation involves.

Section 3

The CRA Paper presents an incomplete and unbalanced summary of the theoretical literature that is at odds with standard presumptions

3.1 The CRA Paper describes the hold-up problem as "*a very well established question which has spawned a vast economic literature…with well-established answers*."[18]

3.2 The CRA Paper appears to consider the "well-established answers" offered by the literature to be captured by the following general propositions:

*"Taken as a whole, what the theoretical literature implies is that one should not necessarily expect hold-up problems to require **any** amount of vertical integration."*[19]

"*Our discussion thus shows that, under realistic conditions, the additional investment benefits that might accrue because of vertical integration are likely to be small compared to the potential harm."*[20]

"In other words, even if vertical integration offered a complete solution to the hold-up problem (which is not necessarily the case), the associated

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18 CRA Paper, page 1, emphasis added.

19 CRA Paper, page 14, emphases in original.

20 CRA Paper, pages 11-12, emphasis in original.

foreclosure incentives suggest that contractual solutions to the investment problem should be preferred."[21]

3.3 In our view the CRA Paper's claim that there is consensus in the theoretical literature establishing a presumption that the efficiency benefits of vertical integration are likely to be small relative to its anticompetitive effects is clearly at odds with the standard presumptions embodied in the literature, authority guidelines, case precedent, and with the views expressed by CRA in other contexts.

3.4 We address these general propositions of the CRA Paper in paragraphs 3.7 to 3.16 below. We consider that the CRA Paper has failed to establish that vertical integration always involves the risk of foreclosure and therefore offers a less attractive solution to hold-up than contracts – on the contrary, theory and evidence and decades of merger control enforcement suggest that vertical integration is more likely than not to be efficient, and that its risks of giving rise to anticompetitive foreclosure are limited and require a number of conditions to be mutually satisfied. Moreover, the extent to which these conditions are satisfied in a particular case cannot be presumed; a case-specific factual analysis is required, taking account of the constraints imposed by existing *ex ante* regulations.[22]

3.5 In addition to these general propositions, the CRA Paper makes a number of more specific propositions as to the effect of various market features on the severity of the hold-up problem.[23]

3.6 We agree that "*the severity of the hold-up problem increases with the proportion of investment costs that become sunk before enforceable agreements can be entered into" and "when it is more difficult to enforce ex ante contracts*".[24] Indeed, these are the defining characteristics of the hold-

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21 CRA Paper, page 2.

22 A detailed case-specific factual analysis of Ofcom's separation proposal can be found in the CL main paper.

23 It is not always clear whether the CRA Paper considers these propositions to follow from its survey of the literature or from its stylised model.

24 CRA Paper, page 2.

up problem. However, for the reasons set out below (see paragraphs 3.17 to 3.37), we disagree that the theoretical literature clearly establishes that "*the hold-up problem is mitigated by downstream competition, downstream investments and repeated interaction" or that the "economic literature does not provide any basis for a conclusion that vertical integration is an efficient response to mitigate uncertainty*".[25]

General conclusions of the literature

3.7 CRA's characterisation of the conclusions of the literature is in stark contrast with more objective assessments of the state of current thinking, such as those offered by Whinston (2003), Gibbons (2005), Klein (2005), Joskow (2006), and Lafontaine and Slade (2007).[26]

3.8 The CRA Paper appears to suggest that the reason why the efficiency benefits of vertical integration are in general likely to be small relative to its anticompetitive effects is because vertically-integrated firms always have an incentive to foreclose downstream rivals:

"It is true that, as we have just seen, greater vertical integration tends to increase the upstream unit's incentives to invest – though such increases are material only under certain conditions. On the other hand, because the vertically integrated firm has an incentive to disadvantage all of its downstream rivals, its downstream arm would "collect" most of the diverted customers even if it does not hold a dominant share downstream. …Our discussion thus shows that, under realistic conditions, the additional

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25 CRA Paper, page 2.

26 Whinston, M.D., 2003, "On the Transaction Cost Determinants of Vertical Integration", Journal of Law, Economics, and Organization 19(1). Gibbons, R., 2005, "Four formal(izable) theories of the firm?", Journal of Economic Behavior & Organization 58. Klein, P.G., 2005, "The Make-or-Buy Decision: Lessons from Empirical Studies", in Ménard, C. and M.M. Shirley, eds. Handbook of New Institutional Economics (Kluwer) (April 2004 version available at http://ssrn.com/abstract=529962). Joskow, P., 2006, "Vertical Integration", Prepared for the American Bar Association Antitrust Section's "Issues in Competition Law and Policy" project (December 2006 version referred to here available at: http://economics.mit.edu/files/1191). Lafontaine, F. and M. Slade, 2007, "Vertical Integration and Firm Boundaries: The Evidence", Journal of Economic Literature, 45(3).

investment benefits that might accrue because of vertical integration are likely to be small compared to the potential harm."[27]

3.9 However, in another paper prepared for Sky, of which Dr Caffarra was also an author, on the subject of Sky's incentives to foreclose competition in the UK pay TV industry, CRA expresses precisely the opposite view:

"While the Complaint describes Sky's "incentives to foreclose" as flowing naturally from its vertical integration, this is incorrect and there can be no general presumption that an integrated supplier has incentives to withhold supply of an upstream input to its downstream rivals.[28]

3.10 More generally, as set out in the CL main paper, the CRA Paper's position is at odds with the standard presumptions set out in the literature.

3.11 For example,

a. Joskow (2006) notes that: "*Overall, I would argue that there is substantial support in the empirical literature for various efficiency motivations for vertical integration. There is minimal empirical support for anticompetitive foreclosure motivations*."[29]

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27 CRA Paper, pages 11-12, emphasis in original.

28 CRA and Prof John Van Reenen, "Sky's "Incentives" to Foreclose Competition in the UK Pay TV Industry: a response to the complaint by BT *et al.*", 29 October 2007, paragraph 51, emphasis added. Footnote 11 in original: "*The classic "one monopoly profit" argument of the Chicago school (e.g., Robert H. Bork, The Antitrust Paradox, Basic Books, 1978) shows that a monopolistic integrated supplier may well wish to sell inputs to its downstream competitors. The subsequent ("post-Chicago") literature has shown that, while not fully general, this intuition is powerful and holds in a broad set of circumstances. The incentives of an integrated monopolist to supply downstream competitors depend on the relative size of the profits that its upstream division could make from such sales and the additional profits that its downstream division would make from the weakening of competitors. These in turn depend on the degrees of upstream and downstream market power, the form of contracts available, the process of price formation (e.g., posted prices or iterated bargaining), and other factors. For a survey, see for instance Michael H. Riordan (2005), "Competitive effects of vertical integration" (available at http://www.columbia.edu/~mhr21/Vertical-Integration-Nov-11-2005.pdf).*"

29 Joskow (2006), page 29. In an earlier version of this work, the author further noted that: "*there is still much to learn about vertical integration, alternative market contracting structures and various hybrid forms. In my view, we have made more progress in understanding and measuring the hazards and*

b. Salop and Culley (2014), note that "*Most vertical mergers do not raise competitive concerns and likely are procompetitive.*"[30] *In addition, the authors note that: "Improved vertical cooperation from a vertical merger might lead to greater investment. One reason is that the merger can improve communication and coordination between firms at different levels of production. The merger also can spur investment by reducing the risk of hold-up*"[31];

c. according to Lafontaine and Slade's (2007) comprehensive survey of the empirical literature on this subject, "*under most circumstances, profit-maximizing vertical-integration and merger decisions are efficient, not just from the firms' but also from the consumers' points of view*",[32] and "*even when we limit attention to natural monopolies or tight oligopolies, the evidence of anticompetitive harm is not strong*";[33] and

d. Motta (2004) finds that "*although in some circumstances [vertical integration] may have some anti-competitive effects"* efficiency effects *"are likely to dominate in most cases*".[34]

3.12 These insights from economic theory and evidence are reflected in a clear presumption in regulatory guidelines and precedent that vertical integration is

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associated costs of market contracting in the presence of alternative transactional attributes than we have about the costs of internal organization and how these costs are affected by different internal organizational and incentive structures." (December 2003 version, pages 42-43, available at: http://economics.mit.edu/files/1176).

30 Salop and Culley, 2014, Potential Competitive Effects of Vertical Mergers: A How-To Guide for Practitioners, revised draft of 8 December 2014, page 5. Available at: http://scholarship.law.georgetown.edu/cgi/viewcontent.cgi?article=2404&context=facpub

31 Salop and Culley, 2014, page 36, emphasis added.

32 Lafontaine and Slade (2007), page 680.

33 Lafontaine and Slade (2007), page 677. In addition, the authors note (page 673) that: "*The evidence in favor of anticompetitive foreclosure is therefore, at best weak, particularly when one considers that the industries studied were chosen because their vertical practices have been the subject of antitrust investigations*."

34 Motta, M., 2004, "Competition Policy: Theory and Practice", Cambridge, Cambridge University Press, page 377. Motta was Chief Economist at DG Competition between 2014 and 2016.

more likely than not to be welfare-enhancing and to give rise to public policy concerns only in limited circumstances:

a. the UK Merger Assessment Guidelines state that "*it is a well-established principle that most [non-horizontal mergers] are benign and do not raise competition concerns*";[35]

b. the EC Non-horizontal Merger Guidelines state that: "*A characteristic of vertical mergers and certain conglomerate mergers is that the activities and/or the products of the companies involved are complementary to each other. The integration of complementary activities or products within a single firm may produce significant efficiencies and be pro-competitive*"[36];

c. the EC Guidelines on Vertical Restraints state that: "*Vertical restraints are generally less harmful than horizontal restraints and may provide substantial scope for efficiencies*"[37] and that "*in general, because of the complementary role of the parties to a vertical agreement in getting a product to the market, vertical restraints may provide substantial scope for efficiencies*"[38]; and

d. the European Court of First Instance in *Tetra Laval/Sidel* held that: "*Since the effects of a conglomerate-type merger are generally considered to be neutral, or even beneficial, for competition on the markets concerned, as is recognised in the present case by the economic writings cited in the analyses annexed to the parties' written pleadings, the proof of anti-competitive conglomerate effects of such a merger calls for a precise*

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35 OFT and Competition Commission, Merger Assessment Guidelines, OFT1254 and CC2 (revised), September 2010, paragraph 5.6.1.

36 European Commission, Guidelines on the assessment of non-horizontal mergers under Council Regulation on the control of concentrations between undertakings, Official Journal C 265 of 18/10/2008, paragraph 13.

37 European Commission, Guidelines on Vertical Restraints, SEC(2010) 411, paragraph 6.

38 European Commission, Guidelines on Vertical Restraints, SEC(2010) 411, paragraph 99.

examination, supported by convincing evidence, of the circumstances which allegedly produce those effects."[39]

3.13 In addition to the above general presumption in favour of the efficiency of vertical integration, it is well established in guidelines and precedent that non-horizontal (i.e. vertical and conglomerate) integration is only likely to give rise to the risk of anticompetitive foreclosure in specific circumstances. In particular, for foreclosure to constitute a valid concern requires not only that the integrated firm has both the ability and incentive to foreclose (and for such ability and incentive to derive from the firm's integrated structure), but that foreclosure would give rise to appreciable anticompetitive effects (in excess of any efficiency benefits).[40] As noted by the CFI in *Tetra Laval/Sidel* and by CRA in its assessment of Sky's incentives to foreclose competition in the UK pay TV industry (see footnote 28 above), the extent to which these conditions are all satisfied in a particular case cannot be presumed; it requires a detailed and case-specific factual analysis.

3.14 Moreover, the CRA Paper's concerns about the potential foreclosure risks of vertical integration neglect the particular characteristics of the telecommunications industry, in which existing *ex ante* regulations specifically mitigate and potentially eliminate the ability of vertically integrated firms to act on the foreclosure incentives the CRA Paper identifies. For example, the assumption on which the CRA Paper's foreclosure concern is premised (i.e. that the upstream firm could (i) refuse to supply or (ii) supply on discriminatory terms) is clearly limited in this context by the EOI obligations applied to Openreach. The requirement for a case-specific assessment of the ability and incentive to foreclose, and for this assessment to take account of the constraints imposed by sector-specific regulations, was

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39 Judgment of the Court of First Instance in Tetra Laval v Commission (Case T-5/02), paragraph 155. Although the CFI refers here to conglomerate mergers, vertical and conglomerate mergers involve analytically equivalent economic trade-offs which is why they are typically referred to generally as "non-horizontal" mergers and are assessed in a similar manner.

40 See, for example, UK Merger Assessment Guidelines (referred to at footnote 35 above), section 5.6, and EC non-horizontal merger guidelines (referred to at footnote 36 above), paragraph 32 *et seq*.

described by the European Commission in *RWE/Essent* and by the Competition and Markets Authority ("CMA") in *BT/EE*.[41]

3.15 Notably, in the context of a recent presentation on the competitive effects of price discrimination in online markets, Dr Caffarra, argued that there was "*not enough recognition [in the European Commission's Vertical Restraints Guidelines] of the pro-competitive rationale for most [vertical restraints]*" and that the "*presumption that [vertical restraints] are efficiency-enhancing [is] not yet established enough*".[42] In addition, Dr Caffarra argued that "c*ompetition authorities* ***continue not to accept contractual incompleteness*** *which is essential to understanding organisational structures and business models – [and]* ***dismiss*** *efficiencies out of hand*".[43]

3.16 We address the issue of the substitutability of vertical integration and vertical restraints in more detail in paragraphs 5.6-5.10 below, but note here that there is a clear inconsistency between the CRA Paper's positions in relation to, on the one hand, the foreclosure risks associated with vertical integration and the scope for contracts to solve hold-up and, on the other, the views of its co-author highlighting the need for (i) empirical analysis of foreclosure incentives (because they do not always arise); (ii) a greater consideration of efficiencies in the context of vertical arrangements and (iii) contractual incompleteness to be more generally recognised because it is "*essential to understanding organisational structures and business models*".

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41 In *RWE/Essent* (Case COMP/M.5467, Commission decision of 23 June 2009, paragraphs 198–206), the Commission found the merged entity to lack the ability to foreclose because such foreclosure would be detected and prosecuted by the relevant sector regulators, while in *BT/EE* (A report on the anticipated acquisition by BT Group plc of EE Limited, 15 January 2016, paragraph 9.23) the CMA noted that: "*regulation can play a role in our assessment of both ability and incentive. This is particularly true in heavily regulated markets such as some of the markets under consideration in this investigation. In some cases regulation specifically addresses BT's ability to cause harm to its downstream rivals (eg a charge control), in others the situation is more nuanced: a non-discrimination obligation could be argued to restrict the merged entity's ability to discriminate against its rivals, or to reduce or even eliminate the incentives to engage in such discriminatory conduct*."

42 Caffarra, 2015, "Online Geographic Discrimination: Unfair, anticompetitive?" antitrustitalia lunch discussion, 16 October 2015, slide 13, emphasis in original. Available at: http://www.antitrustitalia.it/wordpress/wp-content/uploads/2015/09/Price-discrimination-in-online_digital-markets.pptm

43 *Ibid.*, slide 13, emphasis in original.

Assessment of the impact of market circumstances on the extent of hold-up

Downstream competition

3.17 The CRA Paper presents the relationship between downstream competition and the severity of the hold-up problem as being clear-cut and one-way: the incentives for the (non-integrated) upstream firm to invest are always increasing as the degree of downstream competition increases.[44] It is not clear whether the CRA Paper considers this proposition to follow from its survey of the literature or from its stylised model. In either case, it is incorrect.

3.18 The CRA Paper argues that the intuition for this proposition "*is fairly simple*" and follows from observation that "*when there are several firms competing downstream the investor 'can still play those firms again* [sic] *each other' when it comes to selling access to the new facilities, even when the investment cost has been sunk*".[45]

3.19 As a preliminary issue, we note that the key assumption underpinning the CRA Paper's analysis is specifically ruled out in this context by Openreach's regulatory obligation to provide access to all access seekers on EOI terms, which exclude any ability for Openreach to "play the downstream firms off against each other".

3.20 In any event, even if the EOI regulations were not perfect, i.e. such that there was scope for Openreach to discriminate between downstream access seekers after investing in new facilities, the CRA Paper's analysis is flawed.

3.21 For the upstream firm to have the option to provide access to newly-created facilities to more than one downstream firm after the investment has been sunk *requires* that the investments in these facilities are not entirely relationship-specific with respect to a particular downstream firm (i.e. it

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[44] CRA paper, pages 2 and 6-7.

[45] CRA Paper, page 6.

requires the investments to be of at least some common utility).[46] However, as is clearly established in the literature, it is precisely in these circumstances that the upstream firm can face a commitment problem that serves to hold up investments. This is the so-called Coasian dynamics problem, studied by Hart and Tirole (1988) and Rey and Tirole (2007).[47] These seminal papers, which are not cited in the CRA Paper,[48] clearly contradict the CRA Paper's claims that downstream competition serves always to mitigate hold-up problems and to reduce the benefit of forward integration in supporting and promoting investment.

3.22 The insights offered by Coasian dynamics are discussed in detail in the Economic Advisory Group on Competition Policy's paper 'An economic approach to Article 82' (the 'EAGCP Paper') and are recognised in the European Commission's non-horizontal merger guidelines.[49] The EAGCP Paper sets out the intuition clearly. In a non-integrated scenario,

"once it has sold access to a first competitor, [the upstream firm/'bottleneck owner'] has an incentive to provide access to other competitors as well, even though those firms will compete with the first one and reduce its profits; this opportunistic behaviour reduces ex ante *the bottleneck owner's profit (in the example just given, the first firm is willing to pay and buy less); more generally, the bottleneck owner would like to commit to a certain volume of access, so as to limit competition and profit dissipation, but it may be tempted*

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46 In addition, by assuming that the investments are not entirely relationship-specific, the CRA Paper is essentially assuming away a fundamental source of hold-up. It is not surprising for the CRA Paper to find the hold-up problem to be less severe when its very source has been assumed away. Moreover, as noted above (see paragraph 1.9), the absence of relationship-specificity works against Ofcom's 'strategic discrimination' theory of harm.

47 Hart, O.D. and J. Tirole, 1998, "Contract Renegotiation and Coasian Dynamics", The Review of Economic Studies 55(4). Rey, P. and J. Tirole, 2007, "A Primer on Foreclosure", in Armstrong, M. and R. Porter, eds. Handbook of Industrial Organization, volume 3.

48 Indeed, the CRA paper cites no authority in section 2.2.3 in which it discusses the effect of downstream competition on the severity of the hold-up problem.

49 EAGCP, 2005, "An economic approach to Article 82", available at: http://ec.europa.eu/dgs/competition/economist/eagcp_july_21_05.pdf. European Commission, 2008, *Guidelines on the assessment of non-horizontal mergers under the Council Regulation on the control of concentrations between undertakings*, OJ C 265, paragraph 44 and footnote 40.

to grant more access when dealing bilaterally with each competitor; as a result, competition in related markets "percolates" in the bottleneck market and dissipates the dominant firm profit.

In such situations, the intervention of competition authorities may generate more competition in the related markets and thus in the industry as a whole. While any such intervention benefits consumers, e.g. in the short-run through lower prices or in the long-run through higher rates of innovation in the related markets, it also regulates the bottleneck owner's rate of return. In the long-run it may thus have an adverse impact on the dominant firm's incentives to invest or innovate and may for example impede the development of a key infrastructure. No prospective licensee would want to pay much for the use of a new technology if it knew that the licensor would flood the market with similar licensees; mandating access through additional licenses would thus reduce the innovator's profitability and consequently its incentives to invest in R&D."[50]

3.23 Hence, contrary to what is argued in the CRA Paper, increased downstream competition can clearly be associated with more severe hold-up problems. In particular where competition is dynamic, uncertain and winner-take-all, the unlucky losers of contests will seek to renegotiate terms with the upstream firm, the expectation of which can serve to hold up upstream investments. Notably, the CRA Paper would appear to acknowledge precisely this possibility: "…*it is only when a parts supplier goes bankrupt (and thus can no longer care for long-term reputational benefits) that we observe attempts to renegotiate contracts opportunistically"*.[51]

Downstream investments

3.24 The CRA Paper claims that hold-up is less severe where both sides to an upstream-downstream relationship need to make relationship-specific investments.[52] However, absent some reciprocal commitment device, there

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50 EAGCP Paper, pages 27-28

51 CRA Paper, page 14.

52 CRA Paper, section 2.2.4.

is no reason to expect hold-up to be less severe simply because both parties need to make specific investments.

3.25 Nicita and Pagano (2005) provide a simple illustration for why this need not be the case. To paraphrase these authors' discussion:

"One could ask whether the case of bilateral investments differs from the unilateral investment case. The intuition is that with bilateral specific investments, parties may have a strong incentive both to reciprocally commit to contractual obligations and to share the maximum social surplus. However…as long as one party commits to fulfilling the contract, the counterparty maintains strong incentives to hold up. As a consequence nobody will be induced to invest and investment decisions might be delayed indefinitely. The resulting equilibrium will be the inefficient one, characterised by bilateral underinvestments with a complete dissipation of the potential social surplus which would have been generated with specific investments."[53]

Repeated interaction

3.26 The CRA Paper claims that hold-up is mitigated by repeated interaction.[54] In particular, the CRA Paper argues that "the upstream firm's next specific investments can be used as a threat to contain the downstream firm's incentives to opportunistically renegotiate the terms of access to the most recent investment completed by the upstream firm."[55]

3.27 Clearly, the potential for repeated interaction to mitigate the hold-up problem will be lower (i) the fewer are the expected number of future interactions and (ii) the more distant in time are the future interactions (to the extent that firms' have positive discount rates). In both cases the likelihood that uncertain

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53 Nicita and Pagano, 2005, "Incomplete contracts and institutions" in Backhaus, J.G, ed. The Elgar Companion to Law and Economics, Second Edition, Cheltenham, page 149.

54 CRA Paper, pages 2 and 7.

55 CRA Paper, section 2.2.5. The CRA Paper refers the reader to Lafontaine and Slade (2007) for empirical evidence on the effect of repeated interaction on vertical integration. As noted by Lafontaine and Slade (2007, page 645), the evidence on this effect is mixed. We note though that the empirical evidence in Lafontaine and Slade referred to by CRA is concerned with studies of vertical integration motivated by the desire for an upstream firm to address downstream horizontal externalities, such as free-riding between downstream retailers.

expected future losses will outweigh the known current benefits from engaging in hold-up will be lower and the incentives to engage in hold-up consequently greater.

3.28 As discussed in the CL main paper the nature of the investments of relevance in this case are infrequent and long-duration investments that "shape the network".[56] Hence, the prospects for repeated interaction to mitigate hold-up problems in this context are likely to be limited.

Uncertainty about market conditions

3.29 The CRA Paper finds that "*the economic literature does not provide any basis for a conclusion that vertical integration is an efficient response to mitigate uncertainty*".[57]

3.30 It is not clear on what basis the CRA Paper reaches this conclusion. In its discussion of each of the major branches of the literature, the CRA Paper's findings are as follows:

a. Principal-agent theory: "*The prediction of the theory is therefore that greater uncertainty about the downstream market makes vertical integration more efficient and therefore more likely*."[58]

b. Transaction cost theory: "*The transaction cost theory thus also predicts that greater uncertainty should be associated with a greater prevalence of vertical integration*."[59]

c. Property rights theory: "*the property rights literature does not offer easy predictions for a link between uncertainty and vertical integration.*"

3.31 The CRA Paper's own summary of literature therefore appears to contradict the conclusion that it draws from the literature.

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[56] See CL main paper, paragraphs 1.3 and 2.2, and Openreach Consultation, paragraph 3.12.

[57] CRA Paper, page 2.

[58] CRA Paper, page 8, emphasis in original.

[59] CRA Paper, page 8, emphasis in original.

3.32 Unsatisfied with the conclusions of the theoretical literature for its position on this issue, the CRA Paper notes that: "*As the quality of the theoretical literature is rather poor, the emphasis will be on the empirical side*".

3.33 The CRA Paper, with reference to Table 14 in Lafontaine and Slade (2007), summarises the empirical tests of transaction cost economics' predictions in this regard as follows: "*While the empirical literature appears to confirm the theoretical prediction, this support is weak*".[60]

3.34 Put simply, the CRA Paper fails to find support for its hypothesis in either theoretical research or empirical studies and attempts, therefore, to cast doubt on these findings by questioning the quality of the literature and the strength of the empirical support.

3.35 By contrast, the conclusion drawn by Lafontaine and Slade themselves is that "*This table shows that, whenever the effect* [i.e. of uncertainty on the degree of backward integration] *is significant, higher uncertainty leads to more vertical integration. Furthermore, this conclusion is independent of the market in which the uncertainty occurs. The evidence is therefore consistent with [transaction cost economics] predictions.*"[61]

3.36 Finally, the CRA Paper explicitly acknowledges that the "property rights" literature "*does not offer easy predictions for a link between uncertainty and vertical integration*".[62] [63] It is therefore not clear to us how the property rights theory lends support to the CRA Paper's position, or that its lack of empirical testability should be considered a virtue.[64]

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60 CRA Paper, page 21.

61 Lafontaine and Slade (2007), page 658.

62 The property rights literature, which stems from the work of Grossman and Hart (1986), Hart and Moore (1990), and Hart (1995), is concerned with the study of the effects that ownership of physical assets, and the residual rights of control that go along with that ownership, have on the efficiency of trading relationships.

63 CRA Paper, page 21.

64 "*Of course the absence of predictions does not mean that the property rights literature is irrelevant. Indeed, the very fact that that literature suggests that vertical integration should be influenced by a number of more subtle factors that are not accounted for in existing empirical work might explain why*

3.37 For these reasons, we consider the economic support cited in the CRA Paper for the proposition that "the economic literature does not provide any basis for a conclusion that vertical integration is an efficient response to mitigate uncertainty" to be without merit.[65] In fact the theoretical literature and empirical studies suggest the opposite.

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this work has remained so inconclusive as to any potential link between vertical integration and uncertainty." CRA Paper, page 21.

65 We similarly disagree with the CRA Paper's propositions (page 21) that "*Overall, then, both theory and empirical work produce ambiguous results about a potential relationship between vertical integration and uncertainty*" and that "*The claim that uncertainty about downstream markets can be best alleviated through integration is not therefore remotely supported*".

Section 4

The CRA Paper seeks to draw conclusions from a stylised model that is not fit for the task

4.1 In sections 2 and 3 of its paper, CRA seeks to draw insights as to the effect of various market circumstances on the severity of the hold-up problem (and for the efficacy of vertical integration as a solution to hold-up) from a stylised model.

4.2 It is beyond the scope of this paper to undertake a detailed critique of the CRA's model. In the previous section we have shown key predictions of the model to be at odds with standard predictions of the economic literature. For example, as discussed above, to arrive at its proposition that downstream competition tends to mitigate the hold-up problem, CRA's model simply relaxes the assumption of asset specificity: the bargaining position of the upstream firm vis-à-vis each of the downstream firms is improved (and hold-up therefore made less severe) *because* CRA assumes the investment is not specific to any particular downstream relationship.[66] Hence, the CRA model simply assumes what it purports to show.

4.3 Having constructed a model in which asset specificity is low (i.e. salvage values are high) and in which the upstream firm always has an incentive to foreclose, it is not surprising that CRA's model predicts little benefit from integration.

4.4 In our view theoretical models must be judged on the extent to which they capture salient features of the issue being studied. The base case

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66 CRA Paper, section 2.2.3.

considered in the CRA model (a single upstream firm and a single downstream firm) is not relevant for the case at hand. Moreover, the model's predictions in the single upstream firm / multiple downstream firms scenario are fundamentally flawed for reasons set out above. We consider these shortcomings sufficient to dismiss the relevance of CRA's model.[67]

[67] As noted above, a comprehensive critique of CRA's model is beyond the scope of this paper. Accordingly, that we do not deal with the model's treatment of the effect of other factors on the severity of hold-up does not mean that we agree with them.

Section 5

The CRA Paper does not offer any meaningful comparison of the relative merits of vertical integration and contractual arrangements as solutions to the hold-up problem

5.1 In section 3 of its paper CRA seeks to contrast the performance of vertical integration with contractual solutions to the hold-up problem. The CRA Paper summarises its findings as follows:

"The downside of vertical integration is that it increases the risk of foreclosure; thus, while investment may be higher with vertical integration, this may essentially reflect a gain from foreclosing competitors through the exercise of market power upstream – in which case the benefits of the additional investment are questionable. In other words, even if vertical integration offered a complete solution to the hold-up problem (which is not necessarily the case), the associated foreclosure incentives suggest that contractual solutions to the investment problem, which do not create incentives to foreclose, should be preferred."[68]

5.2 In addition, the CRA Paper notes that vertical integration does not necessarily improve upstream incentives to invest because of "*the many*

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[68] CRA Paper, page 2.

costs of vertical integration (e.g. lack of flexibility, bureaucratic in-fighting between divisions for control of corporate resources)".[69]

5.3 In short, the position of the CRA Paper can be summarised as follows: Although vertical integration can solve hold-up problems it always involves the risk of foreclosure and is also likely to involve many other costs. Contracts can be used to solve hold-up and do not involve the risk of foreclosure (or any other costs that are identified by the CRA Paper) so they should be preferred.

5.4 We have already shown above that the CRA Paper has failed to establish that vertical integration always involves the risk of foreclosure and therefore cannot offer an efficient solution to hold-up. On the contrary, theory and evidence suggest that vertical integration is more likely than not to be efficient and that its risks of giving rise to anticompetitive foreclosure are limited.[70] Moreover, the CRA Paper has not explained why, in this particular context, Openreach would have the ability and incentive to engage in strategic investment discrimination, or that, even it did possess the requisite ability and incentive, such discrimination would give rise to anticompetitive effects. As explained above, none of these propositions can be presumed; they require a detailed factual analysis, particularly in circumstances where, as in this case and in telecommunications generally, the relevant markets are already subject to sophisticated and extensive *ex ante* regulations designed to prevent anti-competitive conduct by vertically integrated entities.[71]

5.5 In this section we first address the CRA Paper's apparent claim that contracts never involve a risk of anticompetitive foreclosure and its failure to recognise any costs associated with contractual solutions to hold-up. We then explain why the contractual arrangements discussed by CRA are likely to fail to address the hold-up problem (and may even be expected to give rise to anticompetitive effects) and why the CRA Paper's discussion of anchor tenancy arrangements is confused.

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69 CRA Paper, page 9.

70 See paragraphs 3.11-3.13 above.

71 See paragraph 3.14 and footnote 41 above.

The CRA Paper fails to recognise the substitutability of vertical agreements and vertical integration, both for the realisation of efficiency gains and as mechanisms for foreclosure

5.6 It is not clear whether, in arguing for contracts to be preferred to vertical integration as solutions to hold-up given the risk of foreclosure associated with the latter, the CRA Paper considers that contracts can never give rise to foreclosure concerns, or that only those specific contractual arrangements that do not give rise to foreclosure concerns are the ones that should be preferred. For the purposes of the following discussion we assume the former. However, if instead the CRA Paper is making the latter claim it has not explained (i) how the potentially benign and malign contracts would be distinguished from one another or (ii) why, if such a distinction could readily be made (which it cannot) the same approach could not simply be applied to solutions to hold-up that involve vertical integration.

5.7 To the extent that the CRA Paper is suggesting that contractual arrangements can never give rise to foreclosure concerns we would find this surprising. If that was the case there would presumably be no need for competition laws circumscribing firms' use of vertical agreements. Rather, the reason that such regulations exist and are enforced is because it is well recognised that vertical integration and vertical agreements are substitutes for one another and therefore that the competition concerns associated with the former should similarly apply to the latter.

5.8 For example, Motta (2004) notes:

"We have seen that vertical restraints and vertical mergers have a number of efficiency features: although in some circumstances they might have some anti-competitive effects, a per se prohibition rule would clearly be inappropriate, since it would forego efficiency effects which are likely to dominate in most circumstances. A rule of reason appears certainly more advisable. This statement holds for all types of vertical restraints and vertical mergers: different restraints are often substitutable for one another. Furthermore, there is no unanimous ranking of vertical restraints in terms of welfare. Therefore, there is no economic justification for a policy that treats restraints in a different way…By the same token, it would be inconsistent to

have, say, a tough stance against some vertical restraints, while being lenient on vertical mergers."[72]

5.9 Salop and Culley (2014) make a similar observation, while also noting the relative limitations of contracts for realising efficiencies:

"Exclusionary harms and certain efficiency benefits also might be achieved with vertical contracts and agreements without the need for a vertical merger. … But there may be impediments, such as transaction costs or incomplete contracting, to achieving efficiencies through contract."[73]

5.10 By failing to recognise the substitutability of vertical integration and contractual arrangements as mechanisms for foreclosure, the CRA Paper's assessment of their relative merits in this regard is disingenuous.[74]

The CRA Paper fails to consider the costs and challenges of contractual solutions to hold-up

5.11 In section 3.2 of its paper, CRA describes a number of hypothetical contractual solutions to the hold-up problem identified in the theoretical literature. Apart from the fact that the CRA Paper (i) does not assess the plausibility of the restrictive assumptions on which these theoretical solutions rely (either in general or in the present case), or (ii) explain why the risk of anticompetitive effects would be any lower under these contractual arrangements than under vertical integration, it offers no consideration at all of the practical difficulties and costs associated with designing and enforcing contractual arrangements to address hold-up.

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72 Motta (2004), page 377.

73 Salop and Culley, 2014, page 7.

74 Notably, the CRA Paper (page 31) does appear to acknowledge the scope for contractual arrangements to be used as a means to foreclose competition in its discussion of exclusive anchor tenancy arrangements in a retail shopping context: "*Often, anchor tenants use their power to block investments in a certain shopping mall to secure a space in another shopping mall owned by the same developer. This is both another form of hold-up, which arises after the initial investment in a commercial development has been made (limiting the investor's ability to obtain a further return on investment) and an example of foreclosure occurring even in the absence of full integration.*" This observation clearly works against the CRA Paper's argument that the risk of foreclosure should be considered a disbenefit that is associated only with vertical integration.

5.12 As recognised by, for example, Joskow (2003), the costs and challenges of writing and enforcing contracts to address hold-up problems are likely to be non-trivial, particularly in circumstances where the economic environment is uncertain and the contractual arrangements complex, and therefore that contract arrangements may fail to address hold-up efficiently or at all:

"These considerations help to explain why we observe a wide array of contractual arrangements in the real world that sometimes look very different from the "standard" anonymous spot market transaction that is featured in elementary and intermediate micro economics textbooks. However, these more complex contractual arrangements are unlikely to protect completely against the opportunistic behaviour associated with specific investments and other sources of ex post lock-in, and necessarily incur negotiating, monitoring, enforcement and adaptation costs when changed circumstances push the threat points of the parties outside of the "self-enforcing range."[75]

"When we introduce uncertainty about future production and investment costs, uncertainty about the buyer's ex post valuation and the quantities of the product required, the need for bilateral investments in specific assets to be made by both parties in order to support an efficient trading relationship, and a product quality dimension, we face a much more significant contracting and enforcement problem than in the simple model presented above. Correspondingly, it becomes more and more likely that it will be extremely costly or even impossible to write credible complete contracts that specify ex ante how the buyer and seller will behave when any contingency arises; or to design an associated enforcement mechanism that will require the performance promised or assess damages for non-performance without distorting behaviour and increasing the total costs of the transactions at issue. Moreover, complex long term contracts aimed at tying the hands of the parties so that they cannot behave opportunistically when foreseeable contingencies arise may also embody costly rigidities and have poor adaptive properties when contingencies not specifically provided for in the contract arise (Joskow, 1988, 1990; Williamson 1996, Chapter 4). Accordingly, while complex long term contracts carry potential benefits by better protecting

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75 Joskow, 2003, page 2.

against the opportunistic behaviour associated with specific investments than would simpler but more incomplete contracts, they also incur potential adaptation costs when unanticipated contingencies arise. Inefficiencies associated with ex ante investment distortions and ex post contract performance problems will increase and internal organization will become a relatively more attractive governance structure."[76]

5.13 Absent any assessment of the costs and challenges associated with designing and enforcing contractual arrangements, the CRA Paper is in no position to meaningfully compare how "*contractual solutions between vertically separate firms perform against the solution of vertical integration"*.[77]

The CRA Paper's alleged contractual solutions are either ineffective or potentially anticompetitive and its presentation of the contract theory literature is unbalanced

5.14 In section 3.2.1, the CRA Paper describes a number of contractual mechanisms that have been identified in the theoretical literature as potential means to address hold-up problems. In particular, the CRA Paper identifies "co-development", "long term contacts", "shifting a significant proportion of the user's payment upfront" and "providing significant quantity discounts" as mechanisms to reduce hold-up. The CRA Paper concludes on the basis of its review of the *theoretical* literature that: "*once contractual possibilities are taken seriously, the hold-up problem does not necessarily have a substantial effect on investment incentives"*[78], and that "*Taken as a whole, what the theoretical literature implies is that one should not necessarily expect hold-up problems to require **any** amount of vertical integration*."[79]

5.15 In our view, the conclusions drawn by the CRA Paper from the contract theory literature both in general and in relation to the specific contractual

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[76] Joskow, 2003, page 23.

[77] CRA Paper, page 1.

[78] CRA Paper, page 13, emphasis added.

[79] CRA Paper, page 14, emphasis in original.

possibilities identified significantly overstate the prospects for contractual arrangements to solve hold-up.

5.16 First, the contractual possibilities discussed in the CRA Paper are precisely that, possible solutions to hold-up that could in theory address hold-up problems where the assumptions of those theories are satisfied.[80] The CRA Paper argues for these possibilities to be "taken seriously" but does not evaluate whether or not the assumptions on which they rely are plausible, either in general or in the present circumstances.[81] Contrary to the generalisation offered in the CRA Paper, whether or not suitable contracts can be found to solve the hold-up problem is clearly disputed in contract theory.[82]

5.17 Secondly, in respect of each of the particular contractual arrangements suggested in the CRA Paper, it is not clear (nor does the CRA Paper explain) why they would necessarily (i) be effective in resolving hold-up (in particular in terms of removing the threat of *ex post* renegotiation and doing so at low cost) or (ii) not give rise to potential risks to competition, and therefore why these arrangements would be any more efficient or desirable than vertical integration.

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80 For example, the CRA Paper notes (page 14, emphasis added) that "*Noldeke and Schmidt (1995) show that the hold-up problem disappears entirely **if** the parties can agree on option contracts"* and that *"Aghion, Dewatripont and Rey (1994) show that the underinvestment problem due to hold-up can be solved **if** the initial ex ante contract between parties can specify some minimal (enforceable) rules for any subsequent renegotiation.*" It is clear that the strength of these solutions depends critically on the extent to which their assumptions are valid.

81 These assumptions are generally highly restrictive. For example, the results of Rogerson (1992) cited in the CRA Paper as based on assumptions including (i) no externalities (so that the investments of each party only affect the party itself and not the counterparty); (ii) risk neutrality; and (iii) only one party as partially private information and makes the investment decision. In addition, the results also require that 'powerful' contracts can be written, which in turn requires that (i) 'complex' contracts can designed; (ii) there is credible commitment by both parties; and (iii) there is no renegotiation. These assumptions in other words assume away fundamental sources of hold-up that arise in reality.

82 See, for example, Tirole, 1999, "Incomplete contracts: where do we stand?", Econometrica 67(4).

5.18 For example, in respect of "co-development" arrangements[83], not only does the CRA Paper acknowledge that these effect "*some form of investment-specific "vertical integration" between the upstream party and downstream firms*" but the CRA Paper does not explain (i) how the investment is "specific" if it can be shared with multiple downstream firms; (ii) why the downstream firms would not *ex post* seek to renegotiate the "pre-specified" prices down for the very same reasons that they would seek to renegotiate any other fee structure or (iii) why the risks of anticompetitive foreclosure would be any lower under this arrangements than under full vertical integration.[84] Similarly in respect of the "up-front payment" and "quantity discount" arrangements, the CRA Paper acknowledges that there are "*potential competition policy issues with such contracts*"[85]

5.19 Moreover, as discussed below (see section 8), the CRA Paper has not considered the applicability of these arrangements in the circumstances faced by Openreach, in particular their incompatibility with its existing regulatory obligations.

The CRA Paper's 'anchor tenant' arguments are confused

5.20 In section 3.2.2, the CRA Paper argues that the contractual "anchor tenancy" arrangements that are often observed in a retail property context "*proves that*

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83 The CRA Paper (page 13) describes these as follows: "*In a co-development agreement, the upstream firm shares the ex ante cost of investment with one or more of the downstream firms. This can be in exchange for access to a certain share of the resulting infrastructure (freely or at a pre-specified price). In a sense, such an agreement effects some form of investment-specific "vertical integration" between the upstream party and downstream firms. However, as long as the upstream firm retains the right to set the conditions for access to firms that chose not to take part in the co-development agreement, this arrangement does not create incentives for vertical foreclosure, as actual integration between the upstream firm and some downstream competitors would*."

84 CRA Paper, page 13.

85 CRA Paper, page 13.

contracts can often handle investment issues in vertical relationships perfectly well without any need for integration".[86]

5.21 However, apart from the fact that the CRA Paper does not explain why the risk of hold-up is prevalent in these circumstances (e.g. in terms the investments being relationship-specific), it does not (i) acknowledge that the benefits of anchor tenancy arrangements can be (and are, more typically) achieved by vertical integration; or (ii) explain why contractual anchor tenancy arrangements are immune to the competition risks that the CRA Paper ascribes to vertical integration.

5.22 The mere observation that contractual anchor tenancy arrangements exist provides no evidence, let alone proof, that hold-up is always soluble by contract or that contracts should always be preferred to vertical integration. And the benefits the CRA Paper ascribes to anchor tenancy arrangements in a contractual context (such as their role in relaxing financial constraints, creating positive horizontal externalities[87], reducing the cost of uncertainty and providing effective monitoring and certification of the upstream supplier) can be (and typically are) realised by vertical integration. The CRA Paper provides no argument or evidence to support its claim that certain benefits of anchor tenancy "*would actually not work so well if the anchor tenant were an integrated downstream division of the upstream supplier*".[88]

5.23 Moreover, as for the CRA Paper's discussion of contractual arrangements more generally, the CRA Paper offers no consideration of the compatibility of anchor tenancy arrangements in a contractual context with Openreach's EOI obligations. In the property development context in which these

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86 CRA Paper, page 15. Similarly, in the introduction, the CRA Paper (page 2) describes anchor tenancy arrangements as providing "*additional evidence that solutions [to hold-up] that involve significant amounts of vertical integration are not needed*."

87 A positive externality is the beneficial "side effect" that an activity confers on an unrelated third party. A standard example of a positive *horizontal* externality (i.e. between firms at the same level of the supply chain) is the increase in demand for a retailer's product that arises from a rival retailer advertising the product. In this context a positive horizontal externality could arise, for example, if BT Consumer adopting a particular Openreach technology for its customers also increased demand for the technology by Sky's customers (and in turn by Sky).

88 CRA Paper, page 3.

arrangements are most commonly observed, a specific tenant (the anchor) agrees to rent retail space from a developer (i.e. agrees not to hold-up the development) in exchange for some compensation, for example in the form of reduced rental payments or exclusivity in the form of protection from competition from other tenants. Indeed, absent such compensation the tenant has no incentive to commit not to hold up. But the differential treatment that lies at the heart of anchor tenancy arrangements in this context is directly incompatible with Openreach's open access and non-discrimination obligations.

Section 6

The CRA Paper downplays the findings of the cross-sectional empirical literature on the basis of unfounded methodological concerns

6.1 In section 4 of its paper, CRA seeks to summarise the insights from the empirical literature and finds that the literature studying forward integration "*unambiguously finds that factors that tend to give rise to hold-up have a positive impact on the degree of vertical integration*" and "*provide[s] evidence that vertical integration can be an effective response to conditions that tend to exacerbate the hold-up problem*".[89] The CRA Paper also acknowledges that a major branch of the empirical study of backward integration "*also finds strong evidence that the degree of vertical integration is linked positively to asset specificity and complexity*".[90]

6.2 However, the CRA Paper attempts to downplay the empirical findings set out in the literature on the basis of weaknesses relating to measurement issues, interpretation, and order of magnitude.

Measurement issues

6.3 While the CRA Paper argues that the empirical results suffer from measurement problems,[91] it does not explain how it expects these to have

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89 CRA Paper, page 17.

90 CRA Paper, page 17.

91 CRA Paper, page 18.

influenced the results, neither directionally nor whether the extent of any bias is likely to be meaningful.

6.4 We consider the views offered by Lafontaine and Slade (2007) to offer a more balanced assessment of the effect that measurement issues are likely to have on the validity of cross-sectional empirical research:

"Many of the studies that we present suffer from one or more of these types of problems, as well as major measurement problems as described above, and the extent to which authors have tried to address these problems varies importantly across studies. In the end, however, we believe that a preponderance of evidence, garnered across numerous studies using different approaches in various institutional and industry contexts, is most apt to yield convincing evidence on the validity of various theories."[92]

6.5 In other words, Lafontaine and Slade consider that a sufficient volume of evidence is available that measurement issues in some cases do not undermine the evidential support which these studies can provide for various economic hypotheses.

Interpretation

6.6 The CRA Paper argues that "most of these studies ignore the broader market context in which the firms operate" and that "This creates possible bias due to omitted variables…"[93] But as with its concerns in relation to measurement error, the CRA Paper does not indicate in which direction it expects the results to be biased or how material a problem this is likely to be.[94] Notably, CRA argues that the observed positive correlations between vertical integration and factors associated with hold-up "do not actually tell us much

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92 Lafontaine and Slade, 2007, page 662, emphasis added.

93 CRA Paper, page 19.

94 As noted by Padilla (2006): "*We should also keep in mind there is no such a thing as a perfect economic and econometric model. All models involve simplifying assumptions and/or are based on imperfect data. However, in many circumstances, those simplifications and imperfections do not have a material impact on the quantitative and/or qualitative results of the analysis*." Padilla, 2006, "The role of economics in EU competition law: From Monti's reform to the State aid", Concurrences 2-2016, paragraph 44 (see also footnote 64).

about the relative performance of vertical integration and contracts to deal with hold-up".[95] In addition to the fact that, for the reasons set out above, the CRA Paper does not itself address this critical issue in any meaningful way, the CRA Paper does not explain why it expects firms not to make efficient integration decisions.

Order of magnitude

6.7 Finally, the CRA Paper complains that "most of the empirical literature does not give us any idea of the magnitude of the effects involved".[96]

6.8 By contrast, Lafontaine and Slade (2007) consider there to be sufficient evidence to draw conclusions as to the likely magnitude of the relative effects, at least in respect of the efficiency and anticompetitive effects of vertical integration that are a central concern in the CRA Paper:

"The weight of the evidence is overwhelming. Indeed, virtually all predictions from transaction–cost analysis appear to be borne out by the data. In particular, when the relationship that is assessed involves backward integration between a manufacturer and her suppliers, there are almost no statistically significant results that contradict [transaction cost economics] predictions."[97]

And *"In spite of the lack of unified theory, overall a fairly clear empirical picture emerges. The data appear to be telling us that efficiency considerations overwhelm anticompetitive motives in most contexts. Furthermore, even when we limit attention to natural monopolies or tight oligopolies, the evidence of anticompetitive harm is not strong."*[98]

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95 CRA Paper, page 19.

96 CRA Paper, page 19.

97 Lafontaine and Slade, 2007, page 685.

98 Lafontaine and Slade, 2007, page 677.

Section 7

The CRA Paper's case studies are not informative of the relative merits of vertical integration and contractual arrangements as means to address the risk of hold-up, either in general or in the context of Openreach

7.1 Section 5 of the CRA Paper set out case studies of investment, industry structure and contractual solutions in various industries. The CRA Paper concludes on the basis of these studies that hold-up "*is a routine question that has been addressed multiple times not through vertical integration, but through a variety of contractual solutions*", that "*even industries where vertical integration has been important historically are progressively moving away from integration and are increasingly relying on contractual solutions*", and that "*this evolution seems to reflect both a move towards more modular technologies and the increased sophistication of the contractual solutions which have become available*".[99]

7.2 It is beyond the scope of this paper to undertake a detailed review of the CRA Paper's case studies. We make only the following brief observations.

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99 CRA Paper, page 1.

7.3 First, we consider it highly surprising for the CRA Paper to be able to draw a clear and definitive conclusion in respect of the GM-Fisher Body case[100], an issue on which there remains substantial disagreement between scholars.[101] Further, the CRA Paper asserts a number of criticisms of the hold-up interpretation of the GM-Fisher Body events but fails to provide any evidence in support of the practical relevance of those criticisms.

7.4 Secondly, we do not consider that the CRA Paper clearly establishes any meaningful risk of potential hold-up in a number of these examples – in particular the requirement for investments to be relationship-specific would not appear to be met in some of the examples discussed.[102] Absent a clear risk of hold-up in these examples, the observation that there are contractual arrangements between the parties to the transactions is uninformative of the effectiveness of contracts for addressing hold-up.

7.5 Thirdly, in a number of the examples discussed by the CRA Paper the solutions to the risk of hold-up resemble vertical integration more closely than

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100 The GM-Fisher Body case concerns General Motor's (GM's) acquisition in the early 1900s of Fisher Body, a supplier to GM of body components for its cars. The potential source of hold-up in this case was explained by Klein (2000, page 108) as follows: "*Fisher Body, in order to produce GM's closed auto bodies, had to make an investment in plant and equipment that was specific to GM. […] Fisher Body's GM-specific investments created a potential for GM to hold up Fisher. After Fisher made these investments, GM could have threatened to reduce its demand for Fisher-produced bodies, or even to terminate its relationship with Fisher completely, unless Fisher reduced its body prices to GM*." However, as explained by Klein (2007, page 2): "*The particular importance of the Fisher Body–General Motors case, however, cannot be attributed to the fact that Fisher Body and General Motors vertically integrated to solve a holdup problem created by relationship-specific investments. Many other examples of this phenomenon are documented in the literature. The economic significance of the Fisher Body–General Motors case lies in the fact that Fisher Body and General Motors were not always vertically integrated, but initially operated under a long-term exclusive dealing contract that was ultimately replaced with vertical integration*." Klein (2007) concludes that "*The Fisher Body–General Motors case illustrates the costs of using inherently imperfect long-term contracts to solve potential holdup problems, and therefore the advantages of vertical integration.*" Klein, B. 2000, "Fisher–General Motors And The Nature Of The Firm", Journal of Law and Economics 43. Klein, B., 2007, "The Economic Lessons of Fisher Body-General Motors", International Journal of the Economics of Business, 14(1)

101 See, for example, Klein (2000), *ibid*.

102 For example, it is not clear how investments in airports are specific with respect to any particular airline, or how investments in shopping malls are specific to any particular downstream retailer.

they do contractual arrangements. The CRA Paper recognises this explicitly in the discussion of its submarine cables, ports and natural resource exploitation examples.[103] Moreover, these would appear to be the examples in which the risk of hold-up is greatest given the greater degree of relationship-specificity of the investments concerned.

7.6 Fourthly, as is the case more generally, the CRA Paper does not attempt any meaningful assessment of the relative costs and benefits of vertical integration and contractual solutions in the case studies it considers, whether as means to address potential hold-up concerns or for any other reason. The mere observation that contracts are used in the examples chosen by the CRA Paper is therefore of limited relevance.

7.7 Finally, and perhaps most tellingly, the CRA Paper makes no reference to other telecommunications markets in its case studies notwithstanding that this is the industry of interest in the present case. This could potentially reflect that fact that the structure and features of telecommunications markets tends to contradict the CRA Paper's hypothesis, and that empirical studies have found the replacement of vertically-integrated structures with contractual arrangements in telecommunications to be associated with lower investment and worse outcomes for consumers.

7.8 For example:

a. Crandall *et al*. (2010)[104] note that: "*There is both theoretical and empirical support for the proposition that forced vertical separation of*

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103 Submarine cables (page 31): "*The solutions to this hold-up problem often do involve a degree of vertical integration, but only in the form of joint ventures between the various private and public stakeholders.*" Ports (page 38): "*Nonetheless, the market relies mostly on long-term contracts usually specifying minimum throughput volumes, though in the last years there has also been vertical integration or share ownership by shipping lines in terminal operations*". Natural resource exploitation (pages 45-46): Under the heading "*Contractual solutions to hold-up problems in natural resource exploitation": "Joint ventures: in this arrangement, ownership of the production is specified by the participation of the investor and the State in the joint venture. Both parties participate actively in the operation of the reserve, hence both bear a share of development and operation costs and both are entitled to a share of profits.*"

104 Crandall, R.W., J.A. Eisenach and R.E Litan, 2010, "Vertical Separation of Telecommunications Networks: Evidence from Five Countries", Federal Communications Law Journal 62(3).

telecommunications networks will reduce economic efficiency, slow innovation, and impede performance in markets where it is imposed. Similarly, mandatory unbundling, which vertical separation is supposed to facilitate, has also been shown to harm market performance. The evidence presented here is consistent with both propositions: That is, the evidence shows no increase in either investment or broadband penetration in nations that have mandated vertical separation; indeed, the evidence suggests that vertical separation has impeded the rollout of next generation networks."[105] And "*In sum, economic theory, supported by empirical evidence from a variety of industries, suggests vertical separation in the telecommunications sector separation risks creating substantial problems for innovation and investment, especially when major new infrastructure investments are involved. The evidence presented below suggests these problems are in fact presenting themselves in countries that have imposed vertical separation requirements*."[106]

b. Jamison and Sichter (2010), from an examination of experiences of business separation in the United States telecoms industry find that "*separation lowers efficiency and delays innovation. The natural boundaries of businesses in telecommunications are always changing in unpredictable ways, as are the locations of bottlenecks. Adapting business separation rules to new realities takes time. The resulting regulatory delays create costs, slow the delivery of innovations to the market place, and may slow the development of competition*."[107]

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105 Crandall *et al*. (2010), page 538.

106 Crandall *et al*. (2010), page 509. In addition, the authors note that "*While it may be too early to provide a comprehensive evaluation of the experience of these five countries with functional/operational separation, we can provide some evidence on two important metrics: (1) the growth of broadband penetration; and, (2) network investment and fiber deployment. We find that vertical separation has not had measurable positive effects on either metric; to the contrary, the early evidence suggests the growth of broadband penetration has slowed in countries which have adopted vertical separation, and that investment, especially with respect to NGN fiber networks, has been deterred."* (page 517)

107 Jamison and Sichter, 2010, "Business Separation in Telecommunications: Lessons from the US Experience", Review of Network Economics 9(1). Available at www.bepress.com/rne

c. Grajek and Röller (2012)[108], in a study of more than 70 fixed-line operators in 20 European countries over 10 years, found access regulation (based on a measure including regulated vertical separation and accounting separation obligations)[109] "*to negatively affect both total industry and individual carrier investment*" and thus *"promoting market entry by means of regulated access undermines incentives to invest in facilities-based competition"*. In addition, the authors find evidence of regulatory commitment problem in that higher levels of investment by incumbents encourage greater intervention by regulators to provide regulated access.

7.9 For these reasons we consider the CRA Paper's case studies to be uninformative in general and in particular to lack relevance in the present case.

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108 Grajek, M. and L-H Röller, 2012, "Regulation and investment in network industries: Evidence from European telecoms", Journal of Law and Economics 55(1). (2009 working paper version referred to here available at: http://edoc.hu-berlin.de/series/sfb-649-papers/2009-39/PDF/39.pdf)

109 *Ibid*. page 13.

Section 8

The CRA Paper's application of theory and evidence to the case of Openreach is uninformative

8.1 In section 6 of its paper, CRA seeks "*to apply the main insights of our review of the theory of hold-up, and practical solutions to address it in various industries, to consider whether structurally separating Openreach from the rest of BT would have a negative impact on Openreach's investment incentives.*"[110] The CRA Paper finds in the circumstances faced by Openreach that: "*the characteristics identified in the theory as determinative of the hold-up problem are either not present or well contained. Any hold-up problem must therefore be regarded as small*"; "*Industry experience that we surveyed suggests that contracts can usually be found to address any residual hold-up problem*" and that "*In the context of telecommunications as a regulated industry, hold-up issues are further minimised since the regulator can assist by providing greater assurance that contracts are enforced and by expanding the set of contracts that can be implemented*."[111]

8.2 In our view, the CRA Paper has no reasonable basis for any of these conclusions.[112]

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110 CRA Paper, page 47.

111 CRA Paper, page 61.

112 It is beyond the scope of this paper to address the CRA Paper's discussion (section 6.1) of the size of Openreach's investments in infrastructure upgrades.

Extent of the potential hold-up problem faced by Openreach

8.3 For reasons set out above (see section 3), the insights drawn by the CRA Paper on the effects of various market circumstances on the extent of hold-up are erroneous or incomplete. Accordingly, the CRA Paper's application of these insights is unlikely to be informative of the extent of hold-up that would potentially be faced by a structurally or further functionally separated Openreach.

8.4 In any event, we consider the CRA Paper's assessment of these market factors in the circumstances faced by Openreach to be deficient in a number of respects.

Asset specificity

8.5 As discussed in the CL main paper, the investments of interest in this context are unlikely to be specific to any particular downstream operator.[113] However, while we agree that asset specificity in this context is therefore likely to be low, this is not for reasons argued in the CRA Paper.[114] And in any event, as noted above, vertical separation could nonetheless give rise to investment hold-up even where the specificity of the assets in question is low because of the commitment problems recognised by Coasian dynamics and/or due to the loss of other vertical efficiencies. By giving Openreach a guaranteed source of demand for its investments, Openreach's integration with BT Consumer serves to mitigate the risk of such problems giving rise to hold-up.

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113 CL main paper, paragraphs 4.31-4.44.

114 The CRA Paper (page 50) contends that the "effective" specificity of Openreach's investments in fibre are limited on the basis that, while large, they are "*eminently modular (i.e. one does not need the whole network to be upgraded for fibre to have value)*"[114] and that "*most of the uncertainty about demand is likely to be resolved and a large portion of the fibre network will already be under contract*". However, the investment decisions of Openreach of interest in this case, i.e. those that "shape the network", are not decisions that relate to the deployment of individual fibre links but are instead about broad technology paths along which to proceed. Such decisions lack the modularity claimed by the CRA Paper. Similarly, the nature of downstream demand is unlikely to be "modular" or "separable" in the sense suggested by the CRA Paper: Openreach's customers are likely to want to make a broad and consistent offer to their customers and therefore to have a derived demand for a single, consistent technology.

Downstream competition

8.6 For reasons set out above (see paragraph 3.24 *et seq.*), the CRA Paper's claim that the risk of hold-up that would potentially be faced by Openreach is mitigated by downstream competition ignore (i) the constraints that Openreach's EOI obligations impose on its ability to discriminate between customers in the manner the CRA Paper suggests would mitigate hold-up, or (ii) the insights offered by the Coasian dynamics literature which shows that hold-up can be more severe when an upstream firm faces multiple downstream counterparties (i.e. in the circumstances that would be faced by Openreach absent its EOI obligations).

8.7 The CRA Paper argues that "*regulatory forbearance shown towards BT / Openreach as regards FTTC deployment weakens the constraint on the hold-up problem imposed by downstream competition*."[115] The CRA Paper cites the fact that BT Consumer's share of SFBB exceeds its share of overall broadband in support of this proposition.[116] In our view, BT Consumer's initially large share of SFBB subscribers is less likely the result of regulatory inaction but rather clear evidence of its vertically-integrated structure working effectively to enable it to anticipate and meet customer needs, as well as expand output through new investments made by Openreach which would not otherwise have occurred. Indeed, BT has explained that the NGA investment gave rise to "*payback at the Group level of about 12 years and at the Openreach level of just under 20 years*", and that its vertical integration, by enabling it to take account of both upstream and downstream profitably, "*has delivered clearly positive outcomes in terms of roll-out, take-up and ongoing competition*".[117]

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115 CRA Paper, page 55.

116 CRA Paper, page 55. It is not clear whether the "regulatory forbearance" referred to by the CRA Paper relates to Ofcom having not already imposed structural separation (as implied by the discussion on page 55) or to its decision to apply margin-squeeze rather than cost-based regulation to FTTC access products (as implied by the discussion on page 48).

117 BT DCR Response, 8 October 2015, page 83.

Downstream investments and sequential interaction

8.8 The CRA Paper argues that because Openreach's customers make large investments in content "*There are therefore good reasons to believe that a kind of mutual deterrence arises through hold-up occurring on both sides of the upstream-downstream relationship*" and that "*This would help minimise the potential chilling effect of hold-up on both parties' incentives to invest*".[118] The CRA Paper appears to believe that the risk of hold-up is reduced when both parties invest because retaliation is possible, i.e. because the parties can employ tit-for-tat strategies (e.g. "I will hold you up if you hold me up", and *vice versa*).

8.9 We have already explained above that there is no *a priori* reason to expect hold-up to be less severe simply because both parties need to make specific investments, i.e. that that the sum of two hold-up problems is not zero.[119] Hence, the CRA Paper's observation that these downstream investments create their own risk of hold-up (in the sense that these investments could potentially be held-up by Openreach), serves only to add to the risk of hold-up arising from vertical separation in this context.[120]

8.10 In any event, the CRA Paper's argument is misplaced in the particular context of this case given that (i) Openreach's investments are infrequent and long-lived, and (ii) tit-for-tat strategies only work well when the parties interact repeatedly. As noted above (see paragraph 3.28), and discussed in the CL main paper, the nature of the investments of relevance in this case are infrequent and long-duration investments that "shape the network"; not decisions about the deployment of individual fibre links.[121] Hence, the CRA Paper's claim that hold-up is mitigated because Openreach and its

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118 CRA Paper, page 56.

119 See paragraphs 3.24-3.27.

120 "*Firms that enter into long-term content contracts under the expectation that the fibre infrastructure would keep expanding might therefore be "held up" by Openreach network upgrades*." CRA Paper, page 56.

121 See CL main paper, paragraphs 1.3 and 2.2, and Openreach Consultation, paragraph 3.12.

customers repeatedly interact when each fibre link is deployed is misplaced.[122]

Uncertainty

8.11 The CRA Paper argues that Openreach has access to as much information on consumers' demand and willingness to pay as BT Consumer and that it is therefore irrelevant for the degree of uncertainty faced by Openreach whether BT Consumer and Openreach are vertically integrated.[123]

8.12 Notwithstanding that this is unlikely to be case as a matter fact even with respect to current market conditions (given the different focus and expertise of the respective divisions), this is largely irrelevant for evaluating the risk of hold-up in this context. What matters for the risk of hold-up (in to addition asset specificity) is the ability of the parties to the investment to commit to specific contractual terms covering all future contingencies. The investments of interest in this case (i.e. those "*that shape the network itself*"[124]) have long lead times from inception of the idea to commercial introduction to mass-market take-up. In these circumstances there is likely to be considerable uncertainty on the part of the vertically separate entities about demand conditions *when the investments would come to be commercialised and over the life of the investment*. It is this uncertainty, and the challenges and costs of designing and enforcing contracts to deal with it, that is likely to make it difficult for contractual arrangements to address hold-up in this context.

8.13 For the above reasons we disagree with the CRA Paper's finding that there is reason to believe that the severity of the hold-up problem that would potentially be faced by a more separate Openreach is "small".

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122 CRA paper, Table7, pages 58-59.

123 CRA Paper, pages 57-58. The CRA Paper does not explain whether it considers that BT Consumer would the same information as Openreach in the event that they were separated. To the extent that there was an asymmetry this would seem to have implications for their mutual incentives to commit to contracts.

124 Openreach Consultation, paragraph 3.12.

Scope for hold-up to be addressed by contractual arrangements

8.14 Finally, the CRA Paper argues that any "residual" hold-up problems that would be faced by a more separated Openreach can be solved by contracts.[125] However, CRA does not, and cannot, show that the contractual solutions that it identifies would (i) address Openreach's hold-up risk as effectively as forward integration; (ii) prove less restrictive of competition than forward integration; or (iii) be compatible with Openreach's existing regulatory obligations, in particular its obligations to provide open and non-discriminatory access on equivalence of input terms.

8.15 The CRA Paper considers that "*residual hold-up concerns – if they exist – can be solved by contracts that address the remaining issues*", and describes three examples of contractual arrangements that would "*minimise hold-up and therefore provide sufficient investment incentives*":[126]

a. Fixed fee contracts. The CRA Paper explains that "*Such contracts require the payment by the access seeker of a fixed fee for the investment, irrespective of customer numbers*".[127] However, the CRA Paper does not explain (i) how these fees would be set *ex ante* (and whether they could vary across customers) or (ii) why downstream firms would not seek to renegotiate those fixed fees down *ex post* for the very same reasons they would any other fee structure, and hence why hold-up problems could not arise under these contracts.

b. *Ex ante* contracts. The CRA Paper describes this solution as follows: "*A payment is made before the attractiveness of the investment is known. Essentially, the investment is shared by the investing firm and the downstream firm. This form of contract could also be carried out selectively in the form of a true 3rd party "anchor tenancy*"". However, the CRA Paper does not explain how these arrangements would work in

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125 CRA Paper, page 60.

126 CRA Paper, page 60.

127 CRA Paper, page 60.

practice. In particular, it does not explain (i) why the downstream firms would agree to make upfront payments in the face of uncertainty; (ii) why they themselves would not then be exposed to the risk of hold-up; (iii) whether small downstream firms/new entrants would be able to afford the *ex ante* costs; (iv) how the cost of the investment would be divided among downstream firms (particularly when it is unclear which firm would be more successful); and (v) whether Openreach could favour those companies that pay *ex ante* by focusing its investments on their needs given the common utility of investment. Moreover, the CRA Paper's suggestion that this form of contract could also be carried out "selectively" would appear clearly at odds with Openreach's EOI obligations.[128] As discussed in the CL main paper, the cost of enabling such co-investment/anchor tenancy driven investments may therefore be a weaker EOI regime, if EOI is at all practically feasible in that context.[129] But whether this would give rise to more investment (and whether this would offset any loss of competition) would require a careful assessment, which has not been carried out in the CRA Paper.

c. *Ex post* contracts with fees dependent on the success of the technology. The CRA Paper describes the rationale for these arrangements as follows: "*Under standard access fee contracts, the investing firm does not benefit from an upside when the technology is successful but faces the risk of slow take-up when the technology fails to expand demand, since 3rd party access seekers have the option of not asking for access. That potential hold-up problem can be addressed by ex post contracts when these are modified to allow for varying returns*". However, the CRA Paper does not explain why, like any other *ex post* contract, a contract with contingent fees would be immune to renegotiation. This is particularly the case since it is not clear how one could define success *ex ante* in a way that could not be litigated *ex post*. In addition, the CRA Paper does not explain how potential risks to competition would necessarily be avoided, including the risk that downstream firms might allege that the upstream

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128 CRA Paper, page 60.

129 CL main paper, paragraphs 5.13-5.16.

firm charging very high rates *ex post* when the technology has proved successful is anticompetitive (i.e. accuse the upstream company of holding them up). Furthermore, as discussed above, the CRA Paper has not at all considered the compatibility of such arrangements with EOI.

8.16 In sum, the contractual solutions proposed by the CRA Paper are unlikely or unable to solve the potential hold-up problem that would be faced by Openreach or are not less restrictive of competition or compatible with existing regulations including EOI obligations.