



Review of the wholesale broadband access markets

Second consultation on market definition, market
power determinations and remedies

Consultation

Publication date:	20 August 2010
Closing Date for Responses:	1 October 2010

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Section 1

Summary

Purpose of this document

- 1.1 This document is a further consultation on our review of the wholesale broadband access (WBA) market and should be read together with our earlier consultation published on 23 March 2010 (“the first consultation”)¹. This further consultation considers, in particular, geographic market definition.

Background

- 1.2 On 23 March 2010, we published the first consultation in relation to our review of the WBA market. Within it we made a full set of proposals relating to market definition (both product and geographic), market power assessment and remedies (to address the identified market power).
- 1.3 At that time we identified a total of seven operators that we considered to play a significant role in the market. These operators were; BT, C&W, O2, Orange, Sky, TalkTalk Group (TTG) and Virgin Media, and we referred to them as the Principal Operators (POs).
- 1.4 When defining geographic market areas with reasonably homogeneous competitive conditions, we elected to use the number of POs present as a proxy for the competitive conditions in different areas. This led us to identify four separate geographic markets, as follows:
- The Hull area: (0.7% of UK premises);
 - Market 1: exchanges where only BT is present (14.2% of premises);
 - Market 2: exchanges where two or three POs are present or forecast (13.8% of premises); and
 - Market 3: exchanges where four or more POs are present or forecast (71.3% of premises).
- 1.5 However, since publishing the first consultation, Orange has entered into a long-term exclusive agreement with BT for the supply of wholesale broadband access services. This agreement means that Orange will no longer play a significant role in the wholesale broadband access market considered in this review.
- 1.6 A reduction in the number of POs, from seven to six, will clearly have a direct impact on our identified geographic markets and in particular on the appropriateness of using different proxies to summarise the competitive conditions in this market.
- 1.7 Moreover, there is a broader question about whether our approach to geographic market definition remains appropriate given a number of arguments made in response to our first consultation.

¹ *Review of the wholesale broadband access markets: Consultation on market definition, market power assessment and remedies, 23 March 2010, <http://stakeholders.ofcom.org.uk/consultations/wba/>*

- 1.8 In its comments letter the European Commission noted that in its view geographic delineation which is based primarily on the number of operators present is not, in itself, sufficiently detailed or robust to identify real differences in competitive conditions for the purpose of geographic market definition.
- 1.9 We also received extensive comments and evidence from BT in response to the first consultation. Essentially, BT believes that some parts of the proposed Market 2 have competitive conditions that are more similar to the proposed Market 3 areas. Given this, BT believes that some parts of Market 2 should be moved to Market 3 and, accordingly, de-regulated. BT proposes a number of different approaches to refine the market definition assessment we carried out in our first consultation.
- 1.10 As such, in addition to the implications for the analysis of the Orange agreement, this consultation also addresses the points raised by both the European Commission and BT.
- 1.11 Finally, in the first consultation we took account of operators' broadband deployment plans although we said that, based on information we had gathered from each of the operators at the time, these were somewhat limited. We said that we would seek operators' latest broadband deployment plans and factor these into the analysis for the final statement. We have now gathered these latest plans which indicate that there may be more rollout in future than the previous information showed. The effect of these updated plans is also taken into account in this consultation.

Summary of our proposals

- 1.12 We consider that the proposals we made in the first consultation on the product market definition remain valid. In this document we are consulting on an amended proposal for geographic market definition. We still propose to identify four separate geographic markets. However, we propose to adopt the following criteria:
- The Hull area: (0.7% of UK premises);
 - Market 1: exchanges where only BT is present (11.7% of premises);
 - Market 2: exchanges where two POs are present or forecast and exchanges where three POs are present or forecast but where BT's share is greater than or equal to 50 per cent (10.0% of premises); and
 - Market 3: exchanges where four or more POs are present or forecast and exchanges where three POs are present or forecast but where BT's share is less than 50 per cent (77.6% of premises).
- 1.13 The above geographic market definitions take account of the latest confirmed broadband deployment plans of each of the POs. These updated plans are the reason for the reduction in the size of Market 1 compared to our first consultation. These plans also contribute, along with the impact of the Orange agreement and our updated approach to market definition, to the changes in the sizes of Market 2 and Market 3.
- 1.14 Based on this revised geographic market definition we revisit our SMP analysis. We propose that the analysis in our first consultation remains appropriate given the limited effect of the revised geographic market definition above.

- 1.15 Given that we propose our SMP analysis remains appropriate, we also propose that the remedies discussed in the first consultation also remain appropriate. In this consultation we therefore do not revisit our remedies assessment.

Consultation and next steps

- 1.16 We invite comments from interested parties on the proposals in this document. The consultation period runs for six weeks, to 1 October 2010. Following consideration of responses to the consultation we would expect to publish our conclusions by the end of 2010.

Section 2

Introduction

Scope of this consultation

- 2.1 On 23 March 2010, we published a consultation in relation to our review of the wholesale broadband access (WBA) market (“the first consultation”)². Our approach to the market review taken in the first consultation followed the regulatory framework for electronic communications markets in the EU. We proposed a definition of the WBA market and assessed the state of competition in the market. Where we proposed that competition was not effective we assessed how best we should regulate the behaviour of any company we found to have Significant Market Power (SMP), which is a position of economic strength affording it power to behave to an appreciable extent independently of competitors, customers and ultimately consumers. The period of consultation closed on 1 June 2010.
- 2.2 Since the first consultation, Orange has entered into a long-term exclusive agreement with BT for the supply of wholesale broadband access services. In the first consultation we considered that, because it had deployed its own equipment in order to use the Local Loop Unbundling (LLU) remedy imposed in the upstream Wholesale Local Access (WLA) market, Orange could play a significant role in the WBA market and as such we considered it to be one of seven Principal Operators (POs).
- 2.3 We have considered the potential impact of Orange’s agreement with BT in the WBA market and whether Orange continues to impose a constraint on the supply of BT’s WBA products. We have also considered whether the approach to geographic market definition upon which we consulted in the first consultation remains valid and, even if it does, whether the change in market boundaries that may result from any change in Orange’s status is sufficiently material to require re-consultation.
- 2.4 In addition, we received several comments in relation to our approach to geographic market definition in response to the first consultation.
- 2.5 Because of the Orange agreement and the responses to the first consultation, we consider that it is appropriate to carry out a further consultation on the geographic market definition.
- 2.6 Market definition is not an end in itself. The definition of the relevant economic market is carried out in order to assess whether any operator has SMP in that market. As a result of re-considering our geographic market definition we have also looked again at our market power assessment.
- 2.7 Finally, as the regulatory remedies we proposed in the first consultation were based on the assessment of SMP in each market, we consider in this consultation whether those remedies continue to be appropriate and proportionate in light of any changes in geographic market boundaries or proposed SMP determinations.

² Review of the wholesale broadband access markets: Consultation on market definition, market power assessment and remedies, 23 March 2010, <http://www.ofcom.org.uk/consult/condocs/wba/>

Section 3

Market Definition

Product market definition in the first consultation

- 3.1 In the first consultation we first considered the retail market (both product market and geographic market) before going on to discuss the wholesale broadband access market. As a result, we proposed that the wholesale broadband access product market was:

Asymmetric broadband access and any backhaul as necessary to allow interconnection with other communications providers which provides an always on capability, allows both voice and data services to be used simultaneously and provides data at speeds greater than a dial up connection. This market includes both business and residential customers.

- 3.2 Respondents generally agreed with our product market definition. Orange, Sky, TalkTalk Group (TTG) and Virgin Media all agreed with our product definition. The Federation of Communications Services (FCS) argued that there is a case for separate residential and business markets based on different Quality of Service requirements. Although BT argued that greater account should be taken of competition from bundles, mobiles and satellite broadband in the SMP assessment it agreed that these should not be included in the product market definition in this review. C&W agreed with our product market definition but stressed that we should recognise that WBA is not just used for retail broadband but also for VPN based services. Vodafone did not offer specific comments on product market definition but stated that it “*broadly concurs with the analysis and rationale as explained in the consultation documents and supports Ofcom’s preferred options in both markets*”. O2 and Rutland Telecom did not offer views on product market definition.
- 3.3 The European Commission argued that indirect constraints created by self supply should be assessed at the SMP stage and not included in the market definition. However, it noted that the overall outcome of the review would not be changed by this and hence the issue of where to incorporate self supply could be left as an open question. We address this issue more fully below when we discuss geographic market definition.
- 3.4 In light of the responses to the first consultation we are not proposing any modification to our product market definition.

Geographic market definition

- 3.5 This section summarizes our proposals in the first consultation regarding geographic market definition and discusses the responses we received. We present further analysis following comments submitted by BT and the European Commission in their consultation responses, discuss alternative geographic market definitions and present our preferred option.

Summary of the first consultation

- 3.6 In the first consultation³, we defined geographic markets using the methodology first adopted in the 2008 WBA Statement⁴ and subsequently set down in a Common Position published by the European Regulators' Group (now the Body of European Regulators for Electronic Communications)⁵.
- 3.7 The methodology seeks to identify areas with sufficiently homogeneous competitive conditions and applies to those cases where it has been established that a national market cannot be defined on the basis of common pricing constraints. In the first consultation (and in keeping with our approach in the 2008 WBA Statement) we identified the existence of local pricing in the WBA markets⁶. The method we used in that statement involves three main steps:
- First, the basic geographic unit needs to be selected, for example post codes or exchange areas;
 - Second, the homogeneity of competition needs to be judged according to factors such as barriers to entry, the number of significant suppliers in the market, distribution of market shares and price-cost margins, and as such necessarily means the geographic market definition and SMP analysis are somewhat inter-related; and
 - Third, areas with similar competitive characteristics need to be aggregated in order to define the geographic areas over which to conduct the SMP analysis.
- 3.8 In keeping with our approach in the 2008 WBA Statement, in the first consultation we selected BT's local exchange areas as the geographic unit of analysis⁷. This is because LLU is a significant driver of competition in the WBA market and the geographic area in which an LLU operator can compete is determined by the areas served by the BT local exchanges which it has unbundled⁸. It is also the basis on which BT and LLU operators have generally set their local 'de-averaged' prices.
- 3.9 Competitive conditions were assessed on the basis of a number of factors including market shares, network coverage and the number of Principal Operators (PO) present in the local exchange. The operators classed as POs were: BT, C&W, O2, Orange, Sky, TTG and, in those local exchange areas where cable coverage exceeded 65 per cent of delivery points, Virgin Media⁹.
- 3.10 Using this approach, and after having assessed a number of indicators of the competitive conditions in each of the local exchange areas, we proposed four separate geographic markets, defined using the following proxies for the degree of competition¹⁰:

³ See paragraphs 3.211 to 3.300 of the first consultation

⁴ Review of the wholesale broadband access market, Final explanatory statement and notification - 21 May 2008. <http://stakeholders.ofcom.org.uk/consultations/wbamr07/statement/>

⁵ European Regulators Group, ERG Common position on Geographic Aspects of Market Analysis (definition and remedies), October 2008.

http://erg.ec.europa.eu/doc/publications/erg_08_20_final_cp_geog_aspects_081016.pdf

⁶ See paragraphs 3.230 to 3.236 of the first consultation

⁷ See paragraphs 3.237 to 3.240 of the first consultation

⁸ See paragraphs 3.237 to 3.240 of the first consultation.

⁹ See paragraphs 3.241 to 3.295 of the first consultation

¹⁰ See paragraphs 3.296 to 3.300 of the first consultation

- The Hull area: (0.7% of UK premises);
- Market 1: exchanges where only BT is present (14.2% of premises);
- Market 2: exchanges where two or three POs are present or forecast (13.8% of premises); and
- Market 3: exchanges where four or more POs are present or forecast (71.3% of premises).

3.11 By defining geographic markets on the basis of the number of POs present, we maintained the approach we adopted in the 2008 WBA Statement. We proposed that this was the most appropriate (as well as practical) method of defining geographic markets since we believed that the number of POs present correlates closely with the strength of competition in WBA markets.

Changes in the status of POs since the first consultation

3.12 Since the first consultation was published, one of the POs – Orange – has entered into a long-term exclusive agreement to purchase WBA services from BT. Our understanding is that this means that Orange will, following a period of migration, no longer provide services based on its own LLU deployments. Therefore, our view is that Orange should no longer be considered to be a PO.

BT's consultation response

3.13 BT agreed with our general methodology for defining geographic markets and agreed that it was appropriate to define three separate markets (in addition to a separate market for the Hull Area), including a market where BT is the only operator present (Market 1). However, BT disagreed strongly with our conclusions regarding the correct boundary between Market 2 and Market 3. It argued that there is significant evidence that competition is intense and increasing in many exchanges that fall under the proposed definition for Market 2 and that Market 3 should be defined by the presence of three POs instead of four.

3.14 BT commissioned two expert reports – one by Professor John Nankervis¹¹ and one by SPC Networks¹² – and, drawing on these, BT made the following specific arguments in support of its position¹³.

- a) Ofcom has not accounted properly for the conceptual link between geographic market definition and SMP analysis. BT argues, on the basis of a variety of concentration and competition measures, that it should not be regarded as having SMP in Market 2 exchanges where three POs are present and that these exchanges can be regarded as competitively homogeneous with Market 3. Specifically:
 - BT's market share in exchanges where three POs are present is only slightly above the 50 per cent threshold at which SMP can be presumed. BT presents

¹¹ We have published a non-confidential version of this report today: Economic Modelling of broadband penetration in the UK 2006-2010, Revised 26 June 2010

¹² Wholesale Broadband Access: Geographic Market Definitions in the UK, Prepared for BT plc, 28th May 2010 - http://stakeholders.ofcom.org.uk/binaries/consultations/wba/responses/BT_Annex_3.pdf

¹³ BT also commissioned a report from Dot econ on our proposals for a charge control in Market 1. These arguments will be considered in the separate project discussing options for the charge control in Market 1.

some variants of its analysis of the competitive conditions in exchanges where three POs are present. In one of the variants, BT divides competing POs into Tier A (BT, Sky, TTG and Virgin Media) and Tier B operators (C&W, O2 and Orange¹⁴). BT argues that when it faces two Tier A operators, in exchanges where three POs are present, its market share is only just above 40 per cent. It then argues that on a forward-looking basis these shares are likely to fall further.

- BT also presented charts summarising the Hirschman-Herfindahl Index (HHI)¹⁵ measures for individual exchanges showing levels of concentration that are falling in Market 2 and, that for a large proportion of the exchanges in Market 2, as defined in the first consultation, were similar to Market 3 levels.
 - Retail customer churn rates in Market 2 areas are closer to (indeed above) Market 3 areas than Market 1 areas.
- b) Ofcom has not put sufficient weight on forward-looking considerations, for instance:
- By only considering current plans for future rollout, Ofcom underestimated the likely expansion by LLU operators and Virgin Media between the period covered by their current rollout plans and the end of the period covered by this market review.
 - The entry model used to assess likely future developments is too conservative when compared to other models used by the industry¹⁶. This means the forward-looking assessment of likely growth by competing LLU operators is too conservative.
 - Ofcom has not accounted for the potential migration from off-net supply to on-net supply by LLU operators at unbundled exchanges. The economic incentives are in place for the LLU operators to migrate these customers as quickly as possible.
- c) Ofcom's approach wrongly implies that the effect of the acquisition of Tiscali by TTG *per se* would confer significant market power on BT in those exchange areas in which the merger has the effect of reducing the number of POs from four to three, and which otherwise would therefore have stayed in Market 3. Hence, the 21 exchanges that mechanically move from Market 3 to Market 2 as a result of the merger should be excluded from Market 2 (and remain in Market 3).
- d) Ofcom underestimates the strength of Virgin Media. It should be classed as a PO when it has 50 per cent coverage of a local exchange area, instead of 65 per cent.
- e) Ofcom has arbitrarily excluded one operator (Updata Infrastructure) from the analysis even though strictly speaking it meets the proxy criteria used to define a PO.

¹⁴ Since the agreement between BT and Orange the latter will no longer count as a competing PO as the agreement covers the market review period.

¹⁵ The HHI is defined as the sum of the squared values of market shares and is frequently used as a measure of concentration in the context of merger analysis.

¹⁶ BT references a model produced by Ovum as an example of an alternate model that suggests further deployment may be economic.

Other responses

- 3.15 Most other respondents were satisfied with our geographic market definition assessment. In particular the other POs (C&W, O2, Orange, Sky, TTG and Virgin Media) all agreed with our assessment for the geographic boundaries between the different markets¹⁷.
- 3.16 Vodafone stated that it “broadly concurs with the analysis and rationale as explained in the consultation documents and supports Ofcom’s preferred options in both markets”.
- 3.17 David Hall Systems Ltd offered the view that exchanges where three POs are present should be differentiated from exchanges where two POs are present. The response, however, did not make clear whether the three PO exchanges should then be aggregated into the definition for Market 3, as BT argues.
- 3.18 As discussed above, the European Commission reiterated comments it had made during the 2008 WBA review, where it commented that geographic market definition should be based on more criteria than just the number of operators present in a local exchange, including the levels and trends in market shares. We consider the European Commission’s position in more detail when we consider options for geographic market definition below.

Response on BT’s comments

- 3.19 The aim of the geographic market definition exercise is to identify separate relevant geographic markets based on the homogeneity of competition conditions. In the first consultation (and in our 2008 review), we chose to adopt the number of POs present in a local exchange area as the defining criterion because our analysis showed that in this particular market, and given the particular conditions that existed, this is a good proxy for competitive conditions and correlates closely with many other market outcomes, including market share. Furthermore, our selection of four POs to define the boundary between Market 2 and Market 3 (instead of, say, three POs as BT argues) was made in light of data on market shares and other factors including LLU operators’ network coverage and planned rollout. Our first consultation contains a full assessment of all these factors¹⁸ and explains why, in this particular case, we thought that the use of the number of POs was a good proxy for the degree of competition in different geographic markets.
- 3.20 We note that BT agreed with our proposals regarding the majority of exchanges which account for over 90 per cent of UK premises. Based on the geographic market definition as proposed in the first consultation, BT disagreed with our proposals only in relation to local exchanges where three POs were present or were forecast to be present, of which there were 243. These 243 exchanges represent 4.3 per cent of BT’s local exchanges and serve 6.5 per cent of UK premises. In its response BT argued that these exchanges should be assigned to Market 3, instead of Market 2, and de-regulated. Overall, however, there was a substantial measure of agreement with our proposals from BT and other respondents.
- 3.21 BT presents evidence of heterogeneity in competitive conditions across local exchanges in Market 2 as currently defined. BT argues that, by the standards of an

¹⁷ TTG did not specifically comment on our geographic market definition but agreed with our SMP analysis. The others explicitly agreed with our proposed geographic market definition approach.

¹⁸ See paragraph 3.262 to 3.295 and Annexes 10 and 11 of the first consultation.

SMP assessment, concentration levels are relatively low in the more competitive exchanges in Market 2 and that these can be considered as homogeneous with Market 3 exchanges.

3.22 We recognise that some heterogeneity is present in Market 2 (and in Market 3). Many markets are likely to feature some heterogeneity, however, and this by itself does not mean that Ofcom's proposed market definition is incorrect: the relevant question is whether competitive conditions are sufficiently homogeneous. This does, however, present a challenge to any attempt to draw a boundary between the two. Indeed, in its response, BT also acknowledges the difficulties inherent in the exercise¹⁹. We do, however, disagree with some aspects of the evidence and analysis BT presents on market concentration and competitiveness.

3.23 We now address BT's arguments under the following headings in turn:

- BT's econometric evidence
- BT's use of statistical indicators of competitiveness
- Future rollout
- Competitors' pricing
- The competitive effect of Virgin Media
- The implications of TTG's acquisition of Tiscali
- The status of Udata.

BT's econometric evidence

3.24 We have considered the econometric evidence, prepared by Professor Nankervis on behalf of BT, and have commissioned an independent peer review of it by Professor Frank Verboven. We have published a non-confidential version of Professor Nankervis' report²⁰. Our comments below do not refer to the specific results that have been redacted from the non-confidential version. However, our view is that the conclusions we draw below take full account of this evidence.

3.25 The econometric evidence shows both the effect of entry by LLU operators on the growth rate of BT's penetration at the retail and wholesale level, and the impact of entry by LLU operators on each other. From the research, BT draws the conclusion that entry by one or two POs has a significant impact on BT's position at the wholesale and retail level and that the incremental impact of further entry is low. BT also argues that underlying growth in subscriber volumes Market 2 is stronger than Market 3 and that this will support additional entry in the future.

3.26 We accept that the econometric calculations are conducted in a careful manner using a very detailed dataset. However, we have some reservations about the overall approach and the interpretation of the results. The analysis seems to us to be, to

¹⁹ Annex 1 of BT's response, paragraph 3

<http://stakeholders.ofcom.org.uk/binaries/consultations/wba/responses/BT.pdf>

²⁰ Annex 4 of BT's response: Economic Modelling of broadband penetration in the UK 2006-2010, Revised 26 June 2010 <http://stakeholders.ofcom.org.uk/consultations/wba/?showResponses=true>

some extent, a data driven exercise without a well-defined underlying model of competition to help interpret the results, especially the causal relationships.

- 3.27 In particular, we think it would have been preferable to have conducted an analysis on the level of BT's penetration rather than on the growth rate in its market penetration. As it stands the results are consistent with the possibility that LLU operators tend to enter particular exchanges once overall broadband penetration (based on BT's wholesale supply) is high. In this scenario, entry would inevitably be associated with reductions in BT's growth rate but this would reflect the timing of entry. Although the data allows an analysis of this (and there is a 'location' parameter in the statistical model that would isolate this effect) BT's discussion focuses purely on growth rates.
- 3.28 We also note that the analysis does not distinguish between the effects of entry on expanding overall market penetration and on the market share of other operators. This could help reveal more about the precise nature of the effects of entry. Overall, while we acknowledge the richness of the data used and the sophistication of the methodology, we think the analysis provides only some qualified support for the conclusions BT draws from it. In particular, while the analysis supports the view that the first two entrants have the most significant effect on BT's growth rate, the analysis also shows that additional players do play a role in constraining BT's growth.
- 3.29 As well as the econometrics on growth rates BT also presents evidence based on market shares. Much of this evidence is based on those exchanges where three POs are present and where all these POs are 'Tier A' operators as defined by BT. We believe it is preferable to avoid allocating different weights to different POs, since this is quite subjective and difficult to predict on a forward-looking basis, and instead we prefer to treat all POs equally²¹. It is not clear how BT has divided POs into Tier A and Tier B. For example, BT draws attention to the strength of O2 as a competitor. Yet BT still allocates it to Tier B²², even though the evidence BT presents shows that O2 has similar coverage to, and is present in more exchanges than, Sky which is treated as a Tier A operator. This contributes to an impression of subjectivity in BT's analysis. We take the view that the relative strengths of POs will show up in market shares and coverage and note that in choosing POs as the proxy for competitive conditions we took account of the correlation between number of POs and market share²³.

BT's use of statistical indicators of competitiveness

- 3.30 BT also provides evidence based on Herfindahl-Hirschman Index (HHI) calculations. Again BT argues that there is heterogeneity within exchanges in Market 2. It also demonstrates falling levels of concentration and shows that Market 2 at present has an HHI level close to that of Market 3 in January 2007.
- 3.31 However, we note that the HHI figures BT presents for both Market 2 and Market 3 fall well above common thresholds for a market to be regarded as highly concentrated. For example the European Commission's merger guidance adopts a threshold of 2,000 for a market to be considered 'highly concentrated' while the US Department of Justice adopts a threshold of 1,800 in its current guidelines. This compares to a figure given by BT of 5,300 for Market 2 in March 2010 and 3,000 for

²¹ The approach of defining POs serves to weight different LLU operators to some degree, but is intended to exclude only those operators which clearly do not impose a significant constraint on BT. The threshold is set relatively low and there is a lower risk of subjectivity than in BT's analysis.

²² BT submission, Annex 2, page 78

²³ See para 3.244 of the first consultation.

Market 3²⁴. Seen in this context, it is not clear that the HHI measures are demonstrating significant differences in competitive conditions within Market 2, or even that the HHI is a good indicator of competitive conditions in WBA markets at all.

- 3.32 In addition to concentration measures BT also refers to data showing similar customer churn rates for BT Retail in Market 2 and Market 3. However, it is not clear whether BT is using the correct approach of only measuring churn at the wholesale level (that is churn from BT Wholesale to LLU operators or to Virgin Media) or whether instead it is measuring all churn at the retail level. It appears to us that BT is measuring retail-level churn among suppliers using regulated WBA inputs. As a result the analysis does not seem to be relevant to the issue of whether BT has SMP at the wholesale level as the competitive conditions absent wholesale regulation on BT are likely to be substantially different (see discussion on this issue later in this section).
- 3.33 Finally, BT references academic work showing that the largest benefits to competition come with the addition of the third firm in a market with subsequent entrants having a smaller impact²⁵. We agree that a market does not necessarily have to be highly fragmented before it can be regarded as competitive. However, the number of firms necessary to generate effective competition will vary from market to market and a case specific assessment needs to be made. The paper BT cites looks at very specific markets, namely professional services such as dentists in small towns. The results cannot be extrapolated directly to competition for wholesale supply in a BT local exchange²⁶. Our detailed assessment in the first consultation effectively asks how many competing suppliers are needed in UK WBA markets for those markets to be regarded as effectively competitive²⁷. We are therefore of the view that it is more relevant than the academic research cited by BT.
- 3.34 Overall, whilst recognising that, as would be expected, some exchanges where three POs are present exhibit differences on some competitive metrics from exchanges where two POs are present, we do not think that they should, as a rule, properly be regarded as homogeneous with respect to Market 3.

Future rollout

- 3.35 BT's other main point of disagreement with our proposed geographic market definition concerns our assessment of the forward look in Market 2. In the first consultation we argued that the scope for further entry in Market 2 is limited and that without additional entry there is no reason to expect significant reductions in BT's market share beyond that generated by migration of customers from BT wholesale products to other POs' own networks²⁸. BT places significant emphasis on the continued development of competition within the market over the forward look covered by the review and argues that we have not adequately allowed for likely increases in competition. BT sees potential for entry beyond the stated plans of LLU operators and also points to O2 as an emerging competitor with an aggressive customer acquisition strategy.

²⁴ Note that BT normalises the measure by dividing by 10,000.

²⁵ Brensahan and Reiss (1991) "Entry and competition in concentrated markets", *The Journal of Political Economy*.

²⁶ In any case, the paper is not unambiguous about its conclusions. The supplemental discussion on tyre prices at the end of the paper suggests that although the benefits of further decreases in concentration are low when looking at relatively concentrated markets, there are gains when moving to un-concentrated markets.

²⁷ See paragraphs 3.262 to 3.295 of the first consultation

²⁸ This may occur, for example, where a PO expands its own network footprint into a new exchange or where consolidation occurs.

- 3.36 Our analysis in the first consultation was primarily based on the limited rollout forecasts of POs which we said was consistent with our detailed evidence on cost modelling which suggested that there was more limited scope for further expansion in Market 2²⁹.
- 3.37 Our view is that whilst there may be potential for further deployments, this would not in itself lead us to redefine the boundary of Market 3 as being exchanges where three POs are present or forecast to be present. There will always be uncertainty regarding future developments in the market beyond the firm plans of the POs and a careful judgement has to be made. Different operators will take different views regarding the profitability of expansion, based on the specifics of their business models and their forecasts of conditions in the market. It is our view that in considering the forward look, the future firm rollout plans of the POs should form the basis of the assessment as this is the best indicator of the likelihood of competition developing. Basing an assessment on speculative deployments that are not based on firm rollout plans may result in exchanges being incorrectly allocated to Market 3.
- 3.38 However, we note that the information available in relation to firm rollout plans may not set out the potential for rollout throughout the entire period of the review and so may under-state the development of competition particularly towards the latter part of the forward look.

Competitors' pricing

- 3.39 BT argues that LLU operators' adopt common pricing within their network footprint, which links Market 2 and Market 3 exchanges. This means the competitive conditions of the latter 'spill over' to the former. While we accept that pricing strategies are relevant for an assessment of competitive conditions, the real question, given the purpose of the exercise, is the extent to which they impose competitive constraints on BT. It cannot automatically be assumed that competitive conditions in Market 3 will 'spill over' into Market 2 since the fact still remains that in Market 2 exchanges BT faces fewer competitors, with a smaller share of the market on average, and the overall constraint on its own pricing and actions will be more limited³⁰.
- 3.40 Our view is that the effects of LLU operators' pricing strategies will to a significant extent be reflected in the market shares in Market 2 and hence are already considered in our analysis (see discussion below). If LLU operators are pricing in a particularly aggressive manner they ought to be able to capture a greater proportion of the market than would otherwise be the case. If on the other hand, BT is able to maintain a high market share this suggests the impact of common on-net pricing is not as strong.
- 3.41 We also stress that it is hard to predict LLU operators' pricing policies both over the next few years and, crucially, in the hypothetical world where SMP regulation is removed at the WBA level. LLU operators have undoubtedly been focused on building market share and it is possible that they will alter their pricing strategies as the market becomes more mature.

²⁹ See paragraphs 3.267 to 3.280 in the first consultation.

³⁰ That is, it is different to face two rivals offering on-net prices rather than three or four as the competitive dynamics at the retail level are complex because of bundled offers, product differentiation etc.

The competitive effect of Virgin Media

- 3.42 BT also argues that we have understated the strength of Virgin Media and that a 50 per cent overlap threshold is more appropriate for it to be defined as a PO³¹. In Annex 10 of the first consultation we provided a sensitivity analysis for overlap ranges between 55 per cent and 85 per cent and concluded that the exact threshold chosen made only a marginal difference in terms of moving delivery points between the geographic markets we defined. Furthermore, a threshold above 50 per cent reflects the fact that Virgin Media has a relatively high marginal cost of expansion and its coverage will not react quickly to changes in competitive conditions. While BT asserts that Virgin Media can expand at low additional cost, we believe that Virgin Media's costs of expansion will be far higher than those of an LLU operator which has already unbundled the relevant exchange. Expansion for Virgin Media will involve additional engineering works with a cost in terms of time and money that will significantly exceed those of an LLUO that can expand using BT's existing copper wires. Virgin Media's investment plans will be medium term decisions based on forecasts of broad market developments, including the evolution of technologies and services, not speedy reactions to price changes.
- 3.43 We would also note that while our threshold means that Virgin Media is not counted as a PO where its coverage falls marginally short of 65 per cent, we treat it as a full PO equal to any other where its coverage is only slightly above 65 per cent.

The implications of TTG's acquisition of Tiscali

- 3.44 Since the last market review, the acquisition of Tiscali by TTG has reduced the number of POs in the market with the result that, on existing definitions, 21 exchanges will move from Market 3 to Market 2. BT argues that the geographic market definition criteria should not be applied "mechanistically" and that there is no evidence of a competition problem in these exchanges as the merger has simply established a stronger competitor. However, whilst the merger may indeed have created a stronger potential competitor, it also reduces the number of competitors in the market and this may confer a benefit on all the remaining competitors, including BT.
- 3.45 Even if it is true that, as BT argues, these exchanges have not exhibited a reduced intensity of competition since the merger occurred, they may still be less competitive than they would otherwise have become in the absence of the merger, or than was projected when setting the Market 3 boundary in the 2008 WBA Statement. This is the more relevant question because the market boundary was based on an assessment of competition which was inherently forward looking. If these exchanges were in Market 3 based on a forecast of future rollout from one, or both, of the subsequently merged entities, it may no longer be safe to presume that competition will develop to the same extent in future.
- 3.46 Based on this we took the view in the first consultation that, for the purposes of the geographic market definition, this consolidation should be treated as a reduction in the number of POs. However, we noted that if continuing consolidation were to occur

³¹ BT also claims that during the 2007 Review we changed our methodology for calculating Virgin's presence. However, as footnote 43 on page 88 of the 2008 WBA Statement makes clear the methodology has remained the same and the change in the number of exchanges where Virgin Media is present was the result of a review by Virgin Media of its network coverage in August 2007.

in the industry it may be appropriate to revisit the criteria used to define market boundaries³².

The status of Udata Infrastructure

3.47 Finally, BT argues that we arbitrarily excluded Udata from the assessment by not considering it to be a PO. In the first consultation we set out our reasons why we believe that Udata does not offer a significant competitive constraint in the WBA market. In summary, Udata has just over 10 per cent national coverage and has a business model that focuses exclusively on the public sector. Where it unbundles an exchange it does not aggressively market its products to all customers in that exchange area and it only unbundles exchanges in order to meet specific contracts. As such the competitive constraints it imposes on BT or other firms in the WBA market will be limited. We therefore maintain the view that Udata should not be considered to be a PO.

Taking account of updated rollout plans

3.48 As indicated in the first consultation, we have gathered updated rollout plans from the POs. These plans indicate further rollout (beyond that presented by the same POs to us prior to the first consultation). In providing updated rollout plans since the first consultation, some POs have indicated exchanges where they do not currently have firm plans but where they may, in the future, investigate the business case for deployment. However, in relation to this information, it is difficult for us to predict the likely extent to which this will result in rollout beyond the current firm plans of the POs. Therefore, we only include the firm rollout plans in our analysis of the presence of POs in each exchange.

Summary of responses and developments

3.49 We have set out above a number of developments since our first consultation and substantive responses to that consultation. These are:

- The long-term exclusive agreement between Orange and BT, which effectively means that Orange has exited the WBA market and no longer counts as a PO ("the Orange agreement"),
- Updated rollout plans that indicate rollout by the remaining POs beyond that which we took into consideration in the first consultation;
- Response to the first consultation from the European Commission that market boundary definition should take account of more factors than just the number of operators present; and
- Response to the first consultation from BT that raised some concerns with our proposals.

3.50 In light of these points and notwithstanding our concerns in relation to some of the points raised by BT (which we have addressed above) we consider that it is appropriate to revisit the criteria used to define the market boundaries.

3.51 We discuss below various options for defining the boundary and present our preferred approach.

³² See paragraphs 3.295 and 3.300 of the first consultation

Modifications to geographic market definition³³

- 3.52 As a basis for the following discussion, Table 3.1 below shows the compounded impact of two of the developments – the Orange agreement and the updated rollout plans on each of the markets as defined in the first consultation.
- 3.53 Whilst rollout beyond the firm plans of the POs may occur within the forward look of this review we have only included these specific firm plans in our analysis in Table 3.1 below. We have excluded the exchanges where some POs have indicated an intention to carry out additional analysis on the potential for rollout as this would require us to speculate on the likelihood of this resulting in deployment.

Table 3.1: Changes in markets due to developments since first consultation

Market	First consultation		Updated coverage (including Orange agreement and updated rollout plans)	
	No. Exchs	Coverage	No. Exchs	Coverage
Market 1	3,578	14.2%	3,388	11.7%
Market 2	722	13.8%	856	15.0%
Market 3	1,287	71.3%	1,343	72.6%

Note: the coverage figures relate to all UK premises. The 'missing' 0.7% is the Hull area.

- 3.54 The final two columns represent the baseline for the following discussion. It shows that since the first consultation both Market 2 and Market 3 (based on the approach adopted in the first consultation) have increased in size and accordingly Market 1 has decreased in size.
- 3.55 For Market 1, having considered the responses, we believe that the approach we proposed in the first consultation – that exchanges where only BT is present represents a separate geographic market - remains valid. The options considered below, therefore, focus on whether there is a case for changing the boundary between Market 2 and Market 3.
- 3.56 We take the view that the developments since the first consultation and the detailed analysis and comments we have received in response to the first consultation warrant further consideration of our criteria for geographic market definition with regard to the boundary between Markets 2 and 3.
- 3.57 In particular we recognise that there is some validity in the additional analysis carried out by BT which indicates that competition in some exchanges where three POs are present may be similar to that in exchanges where four or more POs are present (e.g. Market 3), when compared to other exchanges in Market 2 (e.g. those exchanges where only two POs are present) and that the approach to the forward look, based on firm rollout plans, may be conservative and may under-estimate the development of competition.
- 3.58 In the light of the Orange agreement we have also re-considered the effects of consolidation as we indicated we would in the first consultation (paragraphs 3.291 to 3.295). The removal of Orange as a PO means there are now six POs in the market compared to seven when we published the first consultation (and eight when we completed the 2008 review). Whilst it may be correct to maintain the boundaries as defined in the first consultation, we think it is worth considering whether the market

³³ See paragraphs 3.211 to 3.300 of the first consultation for the original proposal on geographic market definition

structure resulting from a reduced number of POs impacts competitive conditions at the exchange level.

- 3.59 As such, we consider below whether alternative approaches to the market boundary criteria may be more appropriate.

Boundary between Market 2 and Market 3 defined by the presence of three POs

- 3.60 As discussed above, in its response, BT has argued that Market 3 should be defined as those exchanges where three or more POs are present. BT presents evidence that the more competitive exchanges in Market 2 have much in common with Market 3, as currently defined, and argues that on a forward looking basis all exchanges where three POs are present will likely acquire these characteristics.
- 3.61 If BT's proposed approach to geographic market definition was adopted (i.e. Market 3 defined as those exchanges where three or more POs are present) then the resultant markets (after the effect of the Orange agreement and the updated firm rollout plans of other POs is taken into account) would be those shown in Table 3.2.

Table 3.2: BT's proposed geographic market definitions

Market	BT's proposal (inc Orange and rollout)	
	No. Exchs	Coverage
Market 1	3,388	11.7%
Market 2	407	5.3%
Market 3	1,792	82.3%

Note: the coverage figures related to all UK premises. The 'missing' 0.7% is the Hull area.

- 3.62 As discussed above, we have some reservations about BT's analysis. Our view is that the degree of homogeneity within the exchanges where three POs are present, and the prospects for further increases in competition, are not sufficient to justify a change from four POs to three POs when defining the boundary of Market 3. However, we recognise that one feature of a geographic market definition based on the number of POs present is that only relatively large incremental adjustments can be made to the definition (i.e. a change from four POs to three POs would represent a reduction in excess of 50 per cent in the size of Market 2). As we have highlighted above, we think BT's concern that there are a number of exchanges currently in Market 2 where the competitive characteristics are closer to those in Market 3 deserves consideration. As such, we consider alternative options below.

Boundary criteria to include weighting of POs

- 3.63 As discussed above we do not believe it would be appropriate to attempt to allocate different weights to different POs in the geographic market definition assessment. We have consistently taken the view that this would be quite subjective and difficult to predict on a forward looking basis. The purpose of defining some operators as POs is not to determine relative strengths among key competitors but to ensure that our analysis captures all those operators which could realistically impose a material constraint on BT. Thus, we exclude only those operators which are "niche" operators or which are too small to impose a material constraint (as already mentioned, Udata cannot be regarded as imposing a material constraint on BT).

The addition of further criteria into the market definition

- 3.64 We still believe that, generally, the number of POs present remains a good indicator of competitive conditions in the WBA markets. This is because the cost structure of market entrants, particularly those using LLU, means that once an operator has deployed a network in a given area, it has a clear incentive to compete aggressively. Consequently, the addition of a PO in a given area can be expected to have an appreciable impact on competition³⁴.
- 3.65 As explained above, we do not consider that the presence of three POs will, in all cases, lead to levels of competition homogenous with those seen in exchanges where four or more POs are present (Market 3 as proposed in the first consultation). Conversely, the potential for future competition to develop (as witnessed, for example, by the updated rollout plans of POs) together with BT's analysis of the levels of competition in exchanges where three POs are present indicates that conditions in some of these exchanges may be such that allocating them to the regulated Market 2 area may be an over-cautious approach.
- 3.66 In response to the first consultation the European Commission's re-iterated its view that geographic market definition should be based on more criteria than just the number of operators present in a local exchange, including the levels and trends in market shares. In the areas where three POs are present, in line with the European Commission's response, we think that including additional criteria would be appropriate to allow a more granular assessment of competitive conditions.
- 3.67 In addition to the number of POs present in the exchange, we think exchange level service share³⁵ would represent a good proxy for the competitive conditions in the exchanges where three POs are present. This is likely to reflect the impact of the other factors that affect competitive conditions (such as pricing and the strength of each competitor). For example, where BT's share has fallen significantly, it is likely that this reduction in BT's share is the result of the aggressive marketing strategies and pricing approaches by the other POs present in the exchange, so that the competitive effect of the presence of other POs is already reflected in service shares.
- 3.68 The ERG Common Position³⁶ sets out four criteria that have particular importance in assessing the homogeneity of competitive conditions. These are barriers to entry, number of operators, market share and pricing and price differences. The ERG Common Position sets out practical difficulties with directly assessing barriers to entry and states that number of operators is a directly observable measure that reflects operators' views on barriers to entry. As such, considering the number of operators takes account of barriers to entry. As set above, our view is that the effects of price and pricing differences are accounted for by assessing service share service. In addition, as highlighted by the ERG Common Position, the assessment would need to discount the effect of SMP regulation whereas BT's prices, as currently observed in these exchanges, are set to take account of SMP obligations, so that an analysis of current pricing would not be appropriate.
- 3.69 Service shares are also likely to provide an effective second test where three POs are present for the following reasons, which we discuss in turn:

³⁴ Annex 7 shows how market shares have changed over time in different exchange areas. The downward trend in BT's market share in areas where there are larger numbers of POs is apparent.

³⁵ Note we refer to service share to reflect exchange level shares, rather than market share that would be considered across the market once defined.

³⁶ ERG Common Position on Geographic Aspects of Market Analysis (definition and remedies), October 2008, http://www.erg.eu.int/doc/publications/erg_08_20_final_cp_geog_aspects_081016.pdf

- It is consistent with the standard list of SMP indicators;
 - WBA markets are now sufficiently mature for competitors to have built up significant shares;
 - It allows for potential differences in the strength of different competitors whilst avoiding subjective divisions of operators into Tier A and Tier B; and
 - It enables us to take account of the competitive impact of Virgin Media in areas where it is not a PO due to limited coverage.
- 3.70 The use of service shares is consistent with standard SMP analysis, where market shares play a central role. In general, (single firm) dominance may be presumed where a market share is above 50 per cent, whilst it is unlikely to be found where market share is below 40 per cent. We recognise that an SMP finding should not be made on the basis of market shares alone and do not do so here. Other factors will therefore be considered as part of the SMP assessment. We also note, as above, that we consider that the number of POs present and the exchange level service share reflect a wide range of metrics not formally included in the geographic market definition when selecting the appropriate thresholds that define the market boundaries.
- 3.71 We did not consider service share at the exchange level in the 2008 WBA review because the market was in a phase of rapid evolution. As such, service shares had not stabilised and much of our analysis was based on future plans of POs. By comparison the market has now matured and a number of competitors have already secured a significant share of the market, with the Orange agreement providing further evidence of market consolidation. Therefore, it is now more appropriate to consider factors other than the number of POs present to more accurately assess the competitive conditions at the exchange level.
- 3.72 Returning to BT's analysis, we have said previously why we do not agree that POs should be split into Tier A and Tier B operators. However, to the extent that there is merit in BT's argument that certain POs or combinations of POs present in certain exchanges results in stronger competition than in other areas, then this should be reflected in service shares. The subjectivity of assigning POs to tiers can be avoided whilst recognising this range of competition conditions by including BT's service share in the assessment criteria, as it would be expected that stronger competition would result in a reduction of the service share of BT.
- 3.73 We have discussed above BT's argument that the presence of Virgin Media should be taken into account where it overlaps an exchange area by 50 per cent or more. Our view remains the threshold should remain higher due to the likely costs faced by Virgin Media in expanding its footprint to serve additional customers within an exchange area. However, setting the exact threshold is likely to be subjective. Including a service share criterion would allow for the impact of Virgin Media's presence in those exchanges where it does not qualify as a PO, but where it has some coverage, to feature in the geographic market definition exercise. While, as we have argued above, it is not appropriate to treat Virgin as a full PO in these exchanges, we can still account for its impact on competitive conditions via a service share criterion.

- 3.74 We have also considered whether we should incorporate other criteria, in addition to the number of POs and service share³⁷, into our analysis. However, we are of the view that the number of POs and service share taken together provide an effective and practical proxy for assessing the homogeneity of competitive conditions so that the effects of other criteria are likely to already be represented by these two criteria. As such, including other factors is unlikely to add additional clarity and, in addition, obtaining exchange level data that is not influenced by existing WBA regulation (which we must disregard for the purposes of market definition) for other criteria is likely to prove problematic.

Options for including a service share criterion

- 3.75 There are a number of ways in which a service share criterion could be incorporated into the geographic market definition exercise. Given that the purpose of defining the market is to inform our SMP assessment, it is natural to use BT's share (as it is the incumbent operator and the largest firm in terms of coverage) when conducting this exercise³⁸.
- 3.76 We think it is appropriate to consider the most recent service share information rather than, for example, taking an average over the last year. As there is little volatility in the service share data over time there is limited risk of one particular month's data being unusually high or low. Furthermore, we recognise that BT's share has exhibited a downward trend over time and the use of an average over a period of time would tend to overstate BT's position.

Service shares in an unregulated market and the inclusion of self-supply

- 3.77 In order to avoid circularity, we also believe that it is necessary to define the market absent SMP regulation at the level being assessed. Currently, BT is the only operator that is regulated in the WBA market (in Market 1 and Market 2) and its regulatory obligations include a requirement to provide wholesale services to other providers. Whilst several POs do provide wholesale services to other providers, BT is by far the largest wholesale supplier. It is, however, possible that absent regulation this would not be the case. Absent SMP regulation BT may choose to operate as a vertically integrated provider, in the same way as Virgin Media, and this would likely result in BT securing a larger retail market share. However, in practice it is unlikely that BT would be able to convert all of its current wholesale sales into retail market share for BT, as some end users are likely to switch to an alternative retail provider – possibly one of the other POs. In addition, or alternatively, absent regulation the other POs may in fact supply more wholesale services and/or invest more in self-supply by unbundling additional local exchanges.
- 3.78 The discussion above highlights the difficulty of making an assessment absent SMP regulation, when it is only possible to observe the market as it currently exists, after participants have adapted their behaviour to the current set of SMP regulations. This being said we have tried to identify some reasonable limits to guide our approach.
- 3.79 For instance, we could assume that absent SMP regulation imposed on BT all of the POs would operate as vertically integrated providers and accordingly there would be no wholesale supply. In this scenario any wholesale supply that does currently exist

³⁷As set out in the ERG Common Position

³⁸Although there may be some exchanges where an operator other than BT has the largest share we do not believe this suggests the likelihood of SMP since, as we discussed in the SMP section of the first consultation, an operator's wider position is relevant, not just their position in an individual exchange.

would be captured by the downstream division of the wholesale supplier. This means the retail market shares would be identical to the wholesale market shares we currently observe.

- 3.80 However, as discussed above, absent SMP regulation imposed on BT, it is unlikely that BT would be able to convert all of its current wholesale services into its own retail market share. As also discussed above, it is also possible that absent SMP regulation other POs would be more successful in supplying wholesale services. Both of these factors indicate that absent SMP regulation BT's wholesale market share would likely be lower than it currently is. However, we do not believe that this effect will be strong in practice. This is because regulation only applies in Market 1 and Market 2 and POs' coverage of these markets is either non-existent (Market 1) or limited (Market 2). Thus, their ability to effectively wholesale and their ability to win a substantial number of end users are both limited.
- 3.81 Given this we consider that it is appropriate to measure service shares at the wholesale level, including both self-supply and wholesale supply as these shares are a good proxy of what the retail market shares would be in the hypothetical and unobservable world of no SMP regulation where we would expect to see a number of vertically-integrated operators (BT, Virgin Media and the LLU operators) competing with each other. In doing this we would include all self-supply, by BT, LLU operators and Virgin Media, when measuring service shares.

Indirect constraints

- 3.82 As we set out in the first consultation, we consider broadband access products based on cable technology to be included in the WBA product market at the retail level³⁹. Therefore, competition from cable will impose an indirect constraint at the wholesale level. That is, although broadband access products based on cable technology may not currently be available at the wholesale level it can still constrain the ability of an operator selling wholesale services to price above the competitive level provided the indirect constraint is sufficiently strong. This is likely because if a wholesale provider were to introduce a price increase, we believe it is reasonable to assume that this increase would ultimately be passed on to the end customer at the retail level. In such a situation the end consumer could avoid the price increase by switching to broadband access products based on cable technology.
- 3.83 What matters for market power is not only whether a purchaser (in this case the intermediate firm) can easily switch to substitutes (i.e. alternative sources of WBA inputs) but also whether that firm's own retail customers can switch to alternative suppliers in response to a price increase which is passed on to them. Availability of direct substitute products at the wholesale level may be one indicator that an increase in the wholesale price will be rendered unprofitable by a reduction in demand but it is not a prerequisite.
- 3.84 Given that the purpose of geographic market definition is to identify areas where an operator has SMP we believe these indirect constraints are relevant for assessing the homogeneity of competitive conditions for the purpose of defining geographic boundaries.
- 3.85 The European Commission in its response to our first consultation raises the issue of whether a purchaser of WBA services would partly absorb any price increase instead of fully passing it on to the retail end customer. If so this would further dilute the

³⁹ See paragraphs 3.85 to 3.87 of the first consultation.

indirect constraint provided from the retail level, potentially to the point where the constraint is no longer effective.

- 3.86 Our analysis of the strength of indirect constraints was contained in paragraphs 3.186 to 3.189 of the first consultation, building on the analysis contained in the previous market review in 2008⁴⁰. We concluded that, as our survey evidence suggests the strength of retail substitution has not materially changed since 2008 (if anything cable broadband is in a stronger position in relative terms than it was in 2008), the previous conclusion that retail substitution constrains wholesale pricing still holds.
- 3.87 We noted that, under the logic of the Hypothetical Monopolist Test, the price of the wholesale broadband access input would be passed on in full. This is because the product in question must be assumed to be supplied at the competitive price prior to the hypothetical increase and, in this case, we would expect the retail level of the supply chain to be competitive. Our view is that there are no significant barriers to entry at the retail level and hence there is no SMP at the retail level as the bottlenecks in the supply chain relate to upstream inputs. In this context we would expect to see full pass through of a wholesale price increase. We further note that, absent regulation, wholesale supply might in some circumstances be priced on a “retail minus” basis (that is, the price is set equal to the retail price minus downstream costs of supply), since this compensates the incumbent for the full cost to it of downstream supply. In this case there is an automatic link between the wholesale price and the incumbent’s own retail price, which will help WBA purchasers pass on any increase in wholesale prices.
- 3.88 In further considering the European Commission’s point in relation to whether indirect constraints should be considered at the market definition or SMP stage, we have noted above that defining geographic market boundaries is linked to the SMP analysis. In the specific case of considering indirect constraints from cable in the geographic WBA markets, we consider that it would be difficult to accurately assess the effects of these constraints in an SMP analysis once the market definition based on local exchanges has been completed. Considering the effect of LLU operators in the market definition stage, but cable only in the SMP assessment, may lead to an inconsistent definition of the geographic markets, noting again that these should be based on the principle of grouping areas on the basis of competitive homogeneity. We therefore think that in the specific case of assessing geographic markets within the WBA market, where the effect of indirect constraints may be significant, including cable within the market definition exercise is helpful in more accurately assessing the constraints that may arise.

The appropriate market share threshold

- 3.89 We now consider the exact service share threshold to use. We first consider the threshold to apply in those exchanges where three POs are present (or forecast to be present) before considering whether it is appropriate to add a service share threshold for exchanges where two POs are present or exchanges where four or more POs are present. We think that exchanges where three POs are present represent the marginal cases where the addition of a service share criterion will be most appropriate.

⁴⁰ For the complete discussion, see paragraphs 3.163 onwards of the WBA consultation published in November 2007.

- 3.90 As we have set out above, service share is likely to be a good proxy for a range of factors including strength of other competitors and pricing. Where BT's share is low, competition in the exchange will reflect to a much larger extent the cost base and business strategies of the other POs, based on their own LLU or cable footprints. Where BT's share is high, on the other hand, it will have much more influence over the products and pricing available within the exchange area.
- 3.91 We think there are two main options for the threshold used to define the boundary between Market 2 and Market 3 in those exchanges where three POs are present, as follows:
- Option 1: Exchanges where three POs are present (or forecast to be present) are allocated to Market 3 if BT's share is less than 50 per cent.
 - Option 2: Exchanges where three POs are present (or forecast to be present) are allocated to Market 3 if BT's share is less than 40 per cent.
- 3.92 The use of thresholds of 40 per cent and 50 per cent has some connection with the presumption about SMP – below 40 per cent there is a presumption of no SMP whereas above 50 per cent there is a presumption of SMP.
- 3.93 Table 3.3 shows the impact that each of these options has on the market definitions and compares these with the baseline case (i.e. as per the first consultation but updated to reflect the Orange agreement and the new rollout plans).

Table 3.3: Impact on markets due to introduction of service share criterion

Market	Option 1 (50% threshold)		Option 2 (40% threshold)	
	No. Exchs	Coverage	No. Exchs	Coverage
Market 1	3,388	11.7%	3,388	11.7%
Market 2	753	12.0%	812	13.7%
Market 3	1,446	75.6%	1,387	73.9%

Note: the coverage figures related to all UK premises. The 'missing' 0.7% is the Hull area.

- 3.94 In considering which of these is more appropriate we think the forward look needs to be considered. If BT's share is likely to remain constant it may be that a lower threshold is more appropriate. However, at the current time BT's share is in decline and the information available to us suggests that this is likely to continue, particularly in exchanges where three POs are present (or forecast to be present). Therefore, in order to properly incorporate a forward look in our assessment we believe that a 50 per cent threshold is more appropriate. This is also more consistent with the greater than expected potential for future rollout that is reflected in the updated figures we present in this document. By using a higher threshold we implicitly allow for further reductions in BT's actual share due to further rollout and the length of time necessary for LLU operators to grow market share once they have unbundled the exchanges.
- 3.95 A further issue is whether we adjust the service shares to reflect the expected impact of migration following entry. We recognise that where an LLU operator has unbundled a local exchange it has a strong incentive to migrate its customers from off-net supply, based on BT's WBA products, to on-net supply. We believe that this is a simple question of whether we allow for these migrations or not when defining the geographic markets.

- 3.96 To allow for these migrations we need to establish how many wholesale products BT is currently supplying to POs in exchanges where the POs are either already present or are forecast to be present in their latest firm rollout plans that we have included in the analysis. The impact of allowing for migrations (based on Option 1 above) is shown in Table 3.4.

Table 3.4: Impact on markets due to inclusion of migration

Market	Option 1 (no migration)		Option 1a (migration)	
	No. Exchs	Coverage	No. Exchs	Coverage
Market 1	3,388	11.7%	3,388	11.7%
Market 2	753	12.0%	660	10.0%
Market 3	1,446	75.6%	1,539	77.6%

Note: the coverage figures related to all UK premises. The 'missing' 0.7% is the Hull area.

- 3.97 Migration will be particularly relevant where an exchange has only recently been or is yet to be unbundled but an LLU operator has firm plans to unbundle the exchange. We recognise that the migration of existing off-net customers will be a significant part of an operator's decision to unbundle an exchange and that, where there are significant barriers to doing so, the unbundling would not have taken place. On the other hand we also recognise that there are situations that make migrating end customers more challenging. For instance, there may be aspects of the service being provided to the end customer, using BT's WBA products, which do not fit readily into the on-net service portfolio of the LLU operator. This can particularly be the case when an LLU operator acquires the end customer through a merger with a WBA-based operator with its own brand and service features.
- 3.98 This being said, on balance we believe that the incentives for migration are strong – and would be increased in the event of an attempt to raise WBA charges - and that it will be significant enough that it should be included.
- 3.99 In Annex 7 we show the evolution of BT's service shares over time, Figure A7.1 shows the evolution of BT's service share over time in exchanges where three POs are present, or are forecast to be present, excluding migration. Figure A7.2 shows the effect of migration on these service shares. As can be seen there has been a general reduction in BT's share since February 2008, in line with the effect arising from LLU deployment in these exchanges. Figures A7.3 and A7.4 show the difference between exchanges where BT's share (taking migration into account) is above and below 50 per cent. This shows that where BT's share would be above 50 per cent, even after migration is accounted for, there has been a much more modest reduction in BT's share between February 2008 and June 2010. This may be a function of a number of factors, such as LLU rollout being much more recent or the effects of competition being less strong, perhaps due to the specific POs in question. On the other hand, where BT's share would be below 50 per cent taking migration into account, we see a much greater reduction in BT's share even in the absence of this migration. For example, BT's share was over 70per cent in around half of these exchanges in February 2008 whereas in June 2010, BT's share was above 70 per cent in only one of these. This much greater reduction in BT's share may be indicative of greater competition or greater maturity of LLU deployments in these exchanges.
- 3.100 We would expect this reduction in BT share to continue (albeit we recognise that in some of these exchanges the rate of change may reduce). Further reductions in BT's

share may occur as a result of the possible additional LLU rollout indicated by POs beyond their currently confirmed plans.

- 3.101 Taking all this into account we propose that in exchanges where three POs are present or forecast to be present, an additional criterion of a BT service share threshold of 50 per cent, after migration is taken into account, should be included in the assessment of the boundary between Market 2 and Market 3.

Service shares in areas where four or more POs are present

- 3.102 We do not propose to consider service shares in areas where four or more POs are present. It is important that we and stakeholders are confident that the criteria used in the geographic market assessment will identify areas in which competitive conditions are genuinely reasonably homogeneous to allow us to aggregate areas into a defined market on which we can then carry out the SMP analysis. However this stage of the analysis is not the assessment of SMP. In light of this, and based on experience to date, we think it is safe to regard areas where four or more POs are present as a competitively homogeneous group for the purposes of SMP analysis.
- 3.103 We do not think that a service share criterion would add value to the geographic market definition assessment in exchanges where four or more POs are present. Here, the number of POs present signals that entry is relatively easy. We do not believe that there is an appreciable risk of BT having SMP in these exchanges. Given the incentive of LLUOs to achieve service share once an exchange is unbundled, we expect competition to be relatively intense. In addition, users have many options to switch supplier where there are four POs present and service share could prove transient if a firm attempted to raise prices. Even where (in a few areas) BT has a high service share, we would expect BT's share to decrease during the forward looking period. Figure A7.9 in Annex 7 shows the evolution of BT's service share in exchanges where four POs have been present since February 2008. There is a general shift towards a lower service share for BT. The most prominent features are the reduction in exchanges where BT's share is above 50 per cent and the large increase in exchanges where BT's share is in the 20 to 30 per cent range. As such, it is our view that, once the effects of the deployment of the fourth PO have materialised, BT's share is likely to be low. We therefore think competition in exchanges where four or more POs are present is sufficiently intense.
- 3.104 Consequently we think the number of POs is the most appropriate indicator of competitive conditions where four or more POs are present. For these reasons we propose to allocate all exchanges where four or more POs are present to Market 3, regardless of current service share. We further note that no respondents to the first consultation argued that some exchanges currently in Market 3 should be reallocated to Market 2.
- 3.105 If evidence emerges that SMP exists in a subset of the Market 3 exchanges and it is being exploited we will look again at the issue in a future market review. We note that we have not so far received any complaints about a lack of competition in exchanges where four POs are present.

Service shares in areas where two POs are present

- 3.106 As discussed above, we do not think we could safely presume that all areas with three POs are necessarily competitively homogeneous or that all are as competitive as the areas where four or more POs are present. But we agree with those respondents who said that at least some may now be. In these circumstances, as set

above, reliance on the number of POs present alone could be too “broad brush”, in these areas. We therefore propose to use service share to identify those areas where three POs are present in which competitive conditions can now be regarded as similar to areas where four or more POs are present.

- 3.107 By contrast we do not believe we could be confident that competitive conditions in an exchange where only two POs are present would be homogeneous with one where four or more POs are present (which would be the implication of putting it in Market 3), even if BT’s share were below 50 per cent. BT’s own evidence, which we refer to above, drew attention to the significance of a third entrant for competition in a market.
- 3.108 We therefore do not think a service share criterion would add value in exchanges where only two POs are present. Responses to the first consultation did not question Ofcom’s proposals regarding these exchanges. The presence of only two POs indicates that such areas are relatively unattractive for entrants and as such, unlikely to be highly competitive. Competitive conditions are unlikely to be similar to areas in which four or more POs are present. We believe therefore that competitive conditions in areas where two POs are present will be largely homogeneous.

Our preferred option

- 3.109 Given increasing consolidation, and in the light of responses from BT and the European Commission, we think it is now appropriate to add a service share criterion to our geographic market definition. We think that this should only be incorporated in situations where three POs are present, since it is in these exchanges that the number of POs present may fail to capture sufficiently differences in competitive conditions. Furthermore we think a 50 per cent threshold is the most appropriate as it allows for the impact of additional entry beyond existing plans and general increases in competition during the forward looking period. We accept that LLU operators have a strong incentive to migrate customers once they have unbundled an exchange and think this should be reflected in the service shares used to define market boundaries.

Conclusion

- 3.110 We believe that competitive conditions in exchange areas where four or more POs are present are sufficiently homogeneous to be regarded as a single market. We further believe that, as a rule, competition in exchanges where three POs are present is likely to be less strong than in exchanges where four POs are present. However, we do not preclude the possibility that competitive conditions in some exchanges where three POs are present may now be similar to exchanges where four POs are present. We have, therefore, examined other indicators, principally BT’s service share, in exchanges where three POs are present and will consider these to be part of Market 3 if BT’s service share is below 50 per cent (on a forward looking basis given known rollout plans and known existing off-net end customers).
- 3.111 We, therefore, propose the following geographic market definitions:
- The Hull area: (0.7% of UK premises);
 - Market 1: exchanges where only BT is present (11.7% of premises);
 - Market 2: exchanges where two POs are present or forecast and exchanges where three POs are present or forecast but where BT’s share is greater than or equal to 50 per cent (10.0% of premises); and

- Market 3: exchanges where four or more POs are present or forecast and exchanges where three POs are present or forecast but where BT's share is less than 50 per cent (77.6% of premises).

3.112 Table 3.5 below summarises number of exchanges and market coverage in Market 1, Market 2 and Market 3 based on this revised definition.

Table 3.5: Impact on markets of the proposed revised approach

Market	No. Exchs	Coverage
Market 1	3,388	11.7%
Market 2	660	10.0%
Market 3	1,539	77.6%

Note: the coverage figures related to all UK premises. The 'missing' 0.7% is the Hull area

Question

Question 1: Do you agree with our revised geographic market definition? If not, please explain why.

Section 4

Market Power

Summary

- 4.1 Market definition is not an end in itself. The definition of the relevant economic market is carried out in order to assess whether any operator has SMP in that market. SMP is the ability to act to an appreciable extent independently of competitors, customers and consumers.
- 4.2 In this section we discuss how the revised proposal for geographic market definition set out previously impacts our SMP proposals.
- 4.3 We propose that the SMP analysis carried out in the first consultation⁴¹ remains appropriate. This is because:
- the updated geographic market definition has a limited effect on the size of each of the separate geographic markets;
 - the limited change in geographic market definition is driven by us refining our assessment of the competitive conditions in the different exchanges, with the result that competitive conditions within the markets are likely to be more homogeneous; and
 - we have additionally used service share to decide whether to allocate exchanges where three POs are present to Market 2 or Market 3, which is consistent with the use of market share in the SMP assessment.
- 4.4 Therefore we propose that:
- BT holds a position of SMP in the provision of WBA services in Market 1;
 - BT holds a position of SMP in the provision of WBA services in Market 2; and
 - No operator holds a position of SMP in Market 3.
- 4.5 In this section we set out the analysis that leads us to our proposals in each of the markets.

Approach to market power assessment

- 4.6 Our approach to market power assessments was set out in the first consultation in paragraphs 4.5 to 4.20.
- 4.7 In assessing market power, as set out in paragraphs 4.18 to 4.20 of the first consultation, we regarded the following criteria as most important in respect of the WBA markets:
- Market growth and market shares;

⁴¹ See section 4 of the first consultation

- Future potential market shares;
- Barriers to entry and expansion, including the impact on number of operators present;
- Economies of scale and scope;
- Excessive pricing (and profitability); and
- Countervailing buyer power.

4.8 However, we also took into account the following criteria in our assessment of SMP in the WBA markets:

- Overall size of the undertaking. As in the 2008 Review, we address advantages stemming from absolute size when considering economies of scale and scope.
- Technological advantages or superiority. As in the 2008 Review, this is considered in the context of barriers to entry.
- Vertical integration. The potential leverage of upstream market power into the downstream market has been addressed by the imposition of LLU remedies in the market for wholesale local access (WLA). The effectiveness of these remedies is reflected in the analysis of competitive conditions in the WBA market.
- Price trends and pricing behaviour. We address these issues in the section on excessive pricing and profitability.

Responses to the consultation

- 4.9 Talk Talk, Virgin Media, Rutland Telecom, Orange, Sky, Communications Workers' Union (CWU) and C&W all agreed with our conclusions on SMP. Vodafone "broadly concurs with the analysis and rationale as explained in the consultation documents and supports Ofcom's preferred options in both markets". FCS believed that BT has market power in all three markets (essentially arguing that indirect constraints do not protect resellers like those it represents).
- 4.10 C&W noted that lower quality in Market 1 and Market 2 areas (specifically a lack of 21CN upgrades) could be evidence of market power.
- 4.11 The European Commission commented that we have not presented sufficient evidence regarding the strength of the indirect constraints that cable and LLU-based retail supply impose on the WBA market. However, the European Commission noted that we do adjust our geographic definition according to whether we think indirect constraints are sufficient. It concludes that it does not affect the regulatory outcome whether this is considered at the definition stage or the SMP stage.
- 4.12 KCOM broadly agreed with our analysis but argued that LLU based entry is more of a possibility in the Hull Area than we suggest.
- 4.13 BT's response was largely focused on our geographic market definition and we have addressed their arguments in the preceding section. BT did also make a number of criticisms of our SMP analysis in its response, including:

- We have inappropriately included LLUOs' off-net supply in unbundled exchanges in BTs market share. Rapid migration means this will shortly be transferred to on-net supply.
- We have not allowed for the impact of bundling on the market. BT believes this increases the market share threshold at which a firm has SMP.
- We underestimate the competitive constraints imposed by mobile, fixed wireless and satellite internet. While recognising that mobile broadband is often a complement, BT argues that a component of demand will treat it as a substitute.
- Regarding Market 2, we are overly pessimistic about the potential for entry. The breakeven threshold for entry is lower than we think, plus LLUOs gain brand benefits from wider coverage. We also understate the size and strength of competitors and, in the wholesale market, the degree of countervailing buyer power.
- Regarding Market 1 BT rejects the argument that it earns a return above its cost of capital. It also believes there is some potential for entry.
- BT also said that it was incorrect to determine it held SMP in 26 exchanges allocated to Market 1 where it does not currently provide service (at either the wholesale or retail level).

Ofcom's response to BT

- 4.14 We have already taken into account many of BT's arguments regarding trends in competition in the WBA market in our current proposals for geographic market definition. Here, we comment on the specific points BT raises about our SMP analysis.
- 4.15 In the first consultation, we noted that there was potential for migration of LLUOs' customers to reduce BT's share further, but concluded that it would not be sufficient to alter our proposals regarding geographic definition or SMP (see paragraphs 3.287 and 4.63). Now that we have added a service share criterion to the definition of Market 2 for which we are proposing to adjust for likely migration, we think it is appropriate to adjust the market shares presented in the SMP analysis. As we fully accounted for the potential for migration in the first consultation we do not consider this change in the treatment of migration volumes to be material in our SMP analysis.
- 4.16 We argued in the product market definition analysis in the first consultation that bundles do not constitute a separate market from stand alone broadband services. To the extent that aggressively priced bundled offerings allow rival firms to compete effectively with BT, this will be reflected in market shares and hence accounted for in our analysis.
- 4.17 BT says on page 24 of its response: "we do not think Ofcom takes sufficient account of the constraining effects of retail bundling on the wholesale markets: our view is that it is likely to reduce both the market share at which a provider of wholesale broadband access has market power and the strength of the remedies that are needed where market power is found". Whilst there is perhaps some ambiguity about BT's views on the implications of bundling for market shares⁴², there is some further clarification on page 51 (paragraphs 40 - 41): "as noted above, BT does not consider

⁴² Specifically, whether "reduce" should in fact be "increase".

that Ofcom has given the requisite attention to the impact of bundling at the retail level... BT's view is that bundling is adding additional competitive pressures irrespective as to whether or not a view is taken of a separate economic market. In practice, this means that certain POs are able to exert additional competitive pressure in particular from Sky, CPH (sic) and Virgin Media".

- 4.18 Retail bundling of course does not by itself reduce BT's market power at the wholesale level, where suppliers of retail bundles use BT WBA. BT's argument therefore seems to be part of its case that some POs (the three operators listed above plus BT itself form "Tier A" – see paragraph 3.14 above) are stronger competitors than others in areas where they use their own networks (via either LLU or cable). We address BT's proposal for Tier A and Tier B operators above in the previous section. Our view is that, to the extent that some competitors are stronger than others (and BT does not provide any evidence that, even if true, this reflects the practice of bundling) then this should already be reflected in market shares.
- 4.19 We also concluded that mobile broadband, fixed wireless and satellite are not in the WBA product market, a conclusion with which BT agrees. This conclusion reflects our view that mobile broadband, fixed wireless and satellite services would not be adequate substitutes for fixed broadband access for most people and would not constrain BT's WBA prices to the competitive level. It is therefore appropriate to exclude them from the SMP analysis. BT's response does not offer any evidence to support the view that these services do generate constraints in the WBA market.
- 4.20 Regarding the likelihood of entry in Market 2 over the four year period covered by this review, the geographic definition proposed in this consultation acknowledges the potential for additional entry in some exchanges to erode BT's market share to a level at which SMP is less of a risk. We have also obtained more up to date information about LLUOs' and Virgin Media's investment plans and incorporated this into the definition.
- 4.21 With respect to those exchanges remaining in Market 2, we maintain the view that economies of scale/density provide an appreciable barrier to entry. We recognise that each operator will make investment plans on the basis of different assumptions and required rates of return and that we might see additional entry beyond current plans during the four year forward look covered by this review. However, our view remains that this is unlikely to be sufficient to erode BT's market share to the point where SMP is no longer a risk. This position is bolstered by our adjustment to the geographic market definition since the average Market 2 exchange now has even higher barriers to entry.
- 4.22 Regarding Market 1, we noted it is very difficult to draw firm conclusions about the returns BT is earning since the result is sensitive to the way in which costs are allocated across markets. Our conclusions on SMP in Market 1 do not rest on our price and profitability analysis since BT has a near monopoly in this market and there are significant entry barriers.

Our proposal on SMP in Market 1

- 4.23 Market 1 is defined as those BT local exchanges where BT is the only PO present.

4.24 In the first consultation we proposed that BT held a position of SMP in Market 1, in particular, because of⁴³:

- its substantial market share;
- the high barriers to entry; and
- the lack of countervailing buyer power.

Our updated proposal on SMP in Market 1

4.25 Based on the small change in Market 1 as described in Table 3.5 above, BT's market share is now:

Table 4.1: Market shares in Market 1

	BT	Other operators
WBA volumes (000s)	2,092 [2,409]	26.8 [37.3]
Market shares	98.7% [98.5%]	1.3% [1.5%]

Note: figures in square brackets are those presented in the first consultation

- 4.26 As can be seen from Table 4.1, Market 1 has reduced slightly in size but remains largely unchanged in terms of BT's market share.
- 4.27 We propose that the market conditions in Market 1 as defined in this consultation are the same as those discussed in the first consultation in paragraphs 4.21 to 4.58.
- 4.28 As such, and for the same reasons as set out in the first consultation, we propose that BT has SMP in the market for the supply of WBA services in Market 1.
- 4.29 In relation to the 26 exchanges highlighted by BT, we propose that these exchanges remain in Market 1 and as such BT has SMP in these exchanges. We do not propose to require BT to supply service at these exchanges unless it receives a reasonable request to provide Network Access at these locations. Assessment of whether a request is reasonable would need to consider, amongst other things, the costs to BT of deploying the necessary network infrastructure to provide service.

Our proposal on SMP in Market 2

- 4.30 Market 2 is defined as those BT local exchanges where two POs are present and those BT local exchanges where three POs are present but where BT's share is greater than or equal to 50 per cent.
- 4.31 In the first consultation we proposed that BT held a position of SMP in Market 2, in particular, because of⁴⁴:

⁴³ See paragraphs 4.21 to 4.58 of the first consultation. Paragraphs 4.22 to 4.27 discuss market share, paragraphs 4.41 to 4.53 discuss barriers to entry and paragraphs 4.54 to 4.57 discuss countervailing buyer power.

⁴⁴ See paragraphs 4.59 to 4.82 of the first consultation. Paragraphs 4.61 to 4.65 discuss market share, paragraphs 4.69 to 4.75 discuss barriers to entry and paragraphs 4.76 to 4.81 discuss other factors.

- its market share;
- barriers to entry; and
- other factors, such as lack of countervailing buyer power and PO coverage.

4.32 As the following analysis shows, we propose that BT has SMP in the market for the supply of WBA services in Market 2, based on our revised proposal for geographic market definition.

Market shares and pricing/profitability

Current shares

4.33 Tables 4.2 and 4.3 outline markets shares in Market 2 based on June 2010 volume data and allowing for the expected migration from off-net to on-net following entry (and during the forward looking period). The geographic market boundaries have been updated using the firm rollout plans provided by the POs.

Table 4.2: Market shares in Market 2

	BT	Other operators
WBA volumes (000s)	1,182 [1,660]	646 [731]
Market share	64.7% [69%]	35.3% [31%]

Note: figures in square brackets are those presented in the first consultation

Table 4.3: Other POs market share in Market 2

	Other POs
WBA volumes (000s) – all other POs combined	644 ⁴⁵
Number of other POs with share over 20%	1
Number of other POs with share over 15% but less than 20%	0
Number of other POs with share over 10% but less than 15%	0
Number of other POs with share less than 10%	4

4.34 Unlike Market 1, BT does face some competition in Market 2, most notably from TTG. However, other than TTG, currently the coverage for each of the other POs is less than 10 per cent. However, the firm rollout plans of all POs (except BT) indicate an increase in coverage for one to over 80 per cent of premises and another to around 50 per cent.

4.35 BT, in facing fewer competitors in this market compared to Market 3, is able to maintain a much higher market share. Following the planned market entry, and assuming that LLU operators will migrate all off-net customers onto their LLU based network post entry, BT is still expected to retain an average market share of 64.7 per

⁴⁵ Note the difference between this figure and that shown for other operators in Table 4.2 is accounted for because the figure in Table 4.2 also includes volumes for those LLU operators not counted as a PO.

cent across all the exchanges in the market. Whilst there may be scope for further investment in Market 2 we expect BT's market share to remain high over the next four years.

- 4.36 As with Market 1, it is possible that, absent the availability of regulated wholesale products, LLU investment would increase, thus reducing BT's (wholesale) market share. However, as discussed below, whilst there is more potential for future entry than in Market 1, we consider that there are still barriers to entry in this market so that future entry during the next four years is unlikely to be sufficient to significantly reduce BT's market power.
- 4.37 Given this, the current market shares provide good reason to believe that BT has SMP in this market and, absent regulation, would be able to raise wholesale prices to the ultimate detriment of end users.

Excessive pricing and profitability

- 4.38 As discussed in the first consultation, at paragraphs 4.66 to 4.68, evidence on pricing and profitability suggests that BT's pricing in Market 2 would not be constrained to the competitive level. In particular, BT's prices have been close to the voluntary ceiling and its ROCE appears to be above its cost of capital. The evidence set out in the first consultation is at least equally applicable to our updated proposal for the definition of Market 2. Overall, we consider that the competitive constraints on BT in the newly defined Market 2 will remain broadly the same or more likely be more limited than in the previously defined Market 2 as the exchanges where BT faces greater competition have been moved to Market 3.

Barriers to entry and expansion

- 4.39 In the first consultation we said that we thought that barriers to entry in Market 2 were still significant, though less so than in Market 1⁴⁶. The exchanges which we are proposing to move to Market 3 under our revised approach are those where entry has been more successful than on average in Market 2. This suggests that barriers to entry are likely to be greater (and in any event certainly not less significant) in the revised Market 2 than in the definition proposed in the first consultation.
- 4.40 As discussed above in section 3, in addition to using service shares our updated geographic market definition proposals also include operators' latest rollout plans. This has resulted in the average size of exchanges in Market 2 reducing, from 5,445 delivery points, as proposed in the first consultation, to 4,334 delivery points, as now proposed. We, therefore, believe that the barriers to entry and expansion in this market will in fact be higher than in the Market 2 as defined in the first consultation.

Sunk costs

- 4.41 In the first consultation we noted that BT had already incurred the sunk costs of entry to serve all customers in Market 2⁴⁷. By contrast, given the limited extent of entry into Market 2, LLU operators would have to sink significant additional costs to achieve comparable coverage in Market 2. This remains the case under the revised definition of Market 2.

⁴⁶ See paragraphs 4.69 to 4.70 of the first consultation

⁴⁷ See paragraph 4.71 of the first consultation

- 4.42 The following table shows the coverage of Market 2 exchanges by each PO in June 2010 and the forecast coverage based on their firm rollout plans (which we have assumed will be implemented by December 2010), based on information provided by each PO. We have not included the more speculative rollout plans indicated by POs in Table 4.4.

Table 4.4: PO coverage in Market 2

	Number of POs present broken down by the percentage of exchanges in Market 2							
	>10%	>20%	>30%	>40%	>50%	>60%	>70%	>80%
Jun 10	3	2	2	2	2	1 (BT)	1 (BT)	1 (BT)
Dec 10	4	3	3	3	2	2	2	1 (BT)

- 4.43 Table 4.4 shows that currently only two POs, other than BT, are present in more than 10 per cent of the exchanges in Market 2, with only one being present in more than 20 per cent of the exchanges. Moreover at the current time this PO is only present in 50 per cent to 60 per cent of exchanges in Market 2. When we factor in the firm rollout plans, which we have assumed go out till the end of 2010, we can see that another PO does plan to extend its coverage in this market. However, this other PO does not have firm plans to roll out beyond 50 per cent of the exchanges, whilst the PO with the largest coverage, after BT, does not have firm plans to roll out beyond 80 per cent of the exchanges. This suggests that there remain barriers to entry and expansion in this market such that there is likely to be limited constraints on BT's behaviour over the forward look period of this market review.

Economies of scale/scope

- 4.44 As discussed in the first consultation⁴⁸, the fixed costs associated with unbundling an exchange means that the average cost per end user is subject to significant economies of scale. With our updated geographic market definition proposals the average size of exchanges in Market 2 is 4,334 delivery points, whereas the average for Market 1 and Market 3 is 978 and 14,315 delivery points respectively. Thus, Market 2 may present a greater opportunity for LLU operators compared to Market 1. However, all planned rollout has already been factored into the geographic market definition.
- 4.45 The average exchange size has reduced since the first consultation, reflecting the fact that the entry that has occurred, and is forecast to occur, is concentrated on the larger exchanges. This means it is more difficult for entrants to achieve sufficient size to benefit from economies of scale in the exchanges that are now proposed to reside in Market 2. We believe that this is likely to limit the extent of any further entry or expansion by competitors to BT in Market 2 and that BT will retain SMP in this market.

Countervailing buyer power and joint dominance

- 4.46 We believe that the assessment we set out at paragraphs 4.76 to 4.81 in the first consultation remains valid.

⁴⁸ See paragraphs 4.74 to 4.75 of the first consultation

- 4.47 Other than BT, TTG is the only operator that has a presence in the majority of Market 2 exchanges. However, TTG does not currently have firm plans to roll out to the whole of Market 2. TTG could provide an alternate source of supply to purchasers of wholesale broadband access products. However, to date, TTG's wholesale sales have been relatively small and it mainly supplies smaller ISPs. In addition, as TTG is not present in every exchange in Market 2, there will be some Market 2 exchanges where a CP will need to purchase from at least one other PO (and in practice probably several other POs). At least one PO, Virgin Media, does not currently supply WBA to third parties. Alternatively, the CP can get complete coverage of Market 2 from BT. Therefore it seems unlikely that any buyer, regardless of size, would be in a position to bargain aggressively with BT in the purchase of wholesale broadband access services in Market 2.
- 4.48 For this reason we do not believe that any current wholesale customer is likely to be able to exert countervailing power to a material extent in Market 2.
- 4.49 With respect to joint dominance we do not consider, having taken into account all relevant Guidance and case law, that joint dominance is relevant in this market, in particular because there is a single firm with such a significant market share.
- 4.50 We, therefore, do not believe that either countervailing buyer power or joint dominance is relevant for the assessment of SMP in Market 2.

Conclusion

- 4.51 We propose that, for the same reasons as set out in the first consultation, which we have considered again in this consultation, BT has a position of economic strength affording it the ability and incentive to behave to an appreciable extent independently of competitors, customers and ultimately consumers. We consider that the conditions of competition in Market 2 will either remain broadly the same as in the first consultation or, potentially, that BT has a position of greater significant market power in the newly defined Market 2 as the exchanges where BT faced the strongest competition in the previously defined Market 2 have been moved to Market 3. Therefore, we propose that BT has SMP in the market for the supply of WBA services in Market 2.

Our proposal on SMP in Market 3

- 4.52 Market 3 is defined as those BT local exchanges where four or more POs are present and those BT local exchanges where three POs are present but where BT's share is less than 50 per cent.
- 4.53 In the first consultation we proposed that no operator has SMP in Market 3, in particular, because of⁴⁹:
- the significant deployment by LLU operators; and
 - the success of LLU operators and Virgin Media in securing market share.
- 4.54 As the following analysis shows, we propose no operator has SMP in the market for WBA in Market 3, based on our updated proposal for geographic market definition.

⁴⁹ See paragraphs 4.83 to 4.93 of the first consultation. Paragraphs 4.84 to 4.86 discuss market share and paragraphs 4.87 to 4.88 discuss barriers to entry.

Market growth and market shares

Current shares

4.55 Tables 4.5 and 4.6 outline markets shares in Market 3 based on June 2010 volume data.

Table 4.5: Market share in Market 3

	BT	Other operators
WBA volumes (000s)	4,557 [3,631]	10,141 [9,116]
Market share	31.0% [28.5%]	69.0% [71.5%]

Note: figures in square brackets are those presented in the first consultation

Table 4.6: – Other POs market share in Market 3

	Other POs
WBA volumes (000s) – all other POs combined	10,131 ⁵⁰
Number of other POs with share over 25% but less than 30%	0
Number of other POs with share over 20% but less than 25%	2
Number of other POs with share over 15% but less than 20%	1
Number of other POs with share less than 15%	2

- 4.56 Based on our updated Market 3 proposal BT's market share is slightly higher, 31.0 per cent compared with 28.5 per cent as set out in the first consultation. The main reason for this is the expansion of Market 3 which results from incorporation of the latest rollout plans provided by POs in our forward looking assessment and the fact that some exchanges where three POs are present have been moved from Market 2 to Market 3.
- 4.57 Although no PO, other than BT, has 100 per cent coverage of Market 3, three are forecast to have coverage of over 85 per cent based on their firm rollout plans (which we have assumed would be implemented by December 2010), with two having coverage of over 90 per cent. In fact, one of these will have coverage of 99.3 per cent.
- 4.58 We anticipate that over the period covered by this review the general pattern of market shares will remain. That is, several large operators will be present in this market with none having a market share significantly higher than the others.

Barriers to entry and expansion

- 4.59 Sunk costs and economies of scale, scope and density can be significant barriers to entry and expansion.

⁵⁰ Note the difference between this figure and that shown for other operators in Table 4.5 is accounted for because the figure in Table 4.5 also includes volumes for those LLU operators not counted as a PO.

Economies of scale/scope/density

- 4.60 As discussed in the first consultation⁵¹, the fixed costs associated with unbundling an exchange means that the average cost per end user is subject to significant economies of scale. With our updated geographic market definition proposals the average size of exchanges in Market 3 is 14,315 delivery points, whereas the average for Market 1 and Market 2 is 978 and 4,334 delivery points respectively. Thus, Market 3 presents a greater opportunity for LLU operators compared to Market 1 and Market 2 as evidenced by their actual investment and their current market shares. The average number of POs in exchanges in Market 3 is five.
- 4.61 The number of entrants suggests that sunk costs and economies of scale are not a barrier to entry, whilst the market share data suggests no single operator has a significant scale advantage.

Countervailing buyer power and joint dominance

- 4.62 The pattern of market shares indicates that the market can be regarded as competitive hence the concept of countervailing buyer power is not relevant for an SMP assessment. We do not believe there is a significant risk of joint dominance in the market given the number of competitors present and the highly innovative nature of the market, the latter of which is likely to make cooperation hard to sustain.

Pricing and Profitability

- 4.63 As noted in the first consultation⁵² the evidence on pricing and profitability is consistent with the existence of effective competition in Market 3. The available data is based on the current market definition. However, the evidence suggests that the strength of competition is generally increasing over time and the new areas added to Market 3 have been selected on the basis of homogeneity of competitive conditions, though existing prices are also likely to have reflected regulation applying in Market 2. We believe that prices and profits in the new Market 3 will continue to be competitively determined in future.

Conclusion

- 4.64 We consider that for the same reasons as set out in the first consultation, which we have tested again in this consultation, we propose that no operator has a position of economic strength affording it the ability and incentive to behave to an appreciable extent independently of competitors, customers and ultimately consumers. Therefore we propose that no operator has SMP in the market for WBA in Market 3.

Questions

Question 2: *In light of the revised geographic market definition presented in this consultation, do your previous comments on SMP remain appropriate? If not, please explain why.*

Question 3: *Do you have any further comments to add in relation to the SMP assessment?*

⁵¹ See paragraph 4.88 of the first consultation

⁵² See paragraphs 4.89 to 4.91 of the first consultation

Section 5

Remedies

Summary

5.1 In this section we discuss the impact of the proposed geographic market definition and updated SMP analysis on the remedies we proposed in the first consultation⁵³.

Remedies proposed in the first consultation

5.2 Table 5.1 shows the remedies proposed in the first consultation.

Table 5.1: Proposed remedies by market

Market	Operator	Remedy
Market 1	BT	<ul style="list-style-type: none"> • Requirement to provide network access on reasonable request • Requirement not to unduly discriminate • Requirement to publish a reference offer • Requirement to notify charges, terms and conditions • Transparency as to quality of service • Requirement to notify technical information • Basis of charges • Charge control • Cost accounting • Requirement to account separately
Market 2	BT	<ul style="list-style-type: none"> • Requirement to provide network access on reasonable request • Requirement not to unduly discriminate • Requirement to publish a reference offer • Requirement to notify charges, terms and conditions • Transparency as to quality of service • Requirement to notify technical information • Basis of charges • Cost accounting • Requirement to account separately

5.3 We discussed these remedies in the first consultation as follows:

- Paragraphs 5.5 to 5.22 set out our framework to imposing ex ante obligations;

⁵³ See section 5 of the first consultation.

- Paragraphs 5.27 to 5.70 discussed our view on the approach to take to remedies in Market 1;
 - Paragraphs 5.71 to 5.187 explained the obligations we were proposing to impose in Market 1;
 - Paragraphs 5.188 to 5.217 discussed our view on the approach to take to remedies in Market 2; and
 - Paragraphs 5.218 to 5.301 explained the obligations we were proposing to impose in Market 2.
- 5.4 The specific conditions we were proposing to impose were set out in Annex 5 of the first consultation.

Impact Assessment

- 5.5 Section 7 of the Communications Act 2003 (“the Act”) sets out our obligations in relation to carrying out Impact Assessments.
- 5.6 In this section we set out that, in our view, the changes to geographic market definition discussed in section 3 do not result in a material change that would impact our approach to remedies and, as such, we are not re-consulting on the remedies we proposed in the first consultation. As such, the impact assessment we carried out in the first consultation⁵⁴ applies equally to this further consultation.

Updated remedies proposals

Market 1 and Market 2 remedies

- 5.7 In this consultation we are considering the impact of our proposed geographic market definition and the impact of this revised geographic market definition on our market power assessment and the remedies we proposed.
- 5.8 Our proposed approach to geographic market definition in this consultation for Market 1 is exactly the same as that set out in our first consultation. Given that the conditions of competition in Market 1 are the same, we propose that the same remedies should be imposed in Market 1 as we set out in our first consultation (see paragraphs 5.1 to 5.26 and paragraphs 5.27 to 5.187 of the first consultation).
- 5.9 Our proposed approach to geographic market definition in this consultation for Market 2 is slightly different to that set out in our first consultation. This revised approach, in conjunction with the updated rollout information, will result in 338 exchanges moving from Market 2 and into the (deregulated) Market 3. These 338 exchanges cover 8.6 per cent of UK premises. This compares to the proposal in our first consultation that 114 exchanges, covering 3.4 per cent of premises, would move from Market 2 to Market 3. We consider that the conditions of competition in Market 2 will remain materially the same and we therefore propose to impose the same remedies as we set out in our first consultation (see paragraphs 5.188 to 5.304 of the first consultation).
- 5.10 In response to this consultation we seek stakeholders’ views on our proposed approach, in particular whether the remedies proposed in the first consultation, as set

⁵⁴ See paragraphs 5.23 to 5.26 and Annex 6 (paragraphs A6.37 to A6.41) of the first consultation

out in Table 5.1 above, should be re-considered in light of the updated geographic market definition.

- 5.11 We note that there were several comments from respondents in relation to the remedies above in response to the first consultation, some of which disagreed with our original proposal for remedies. As set out in this consultation we are not proposing any material modifications to the remedies we proposed in the first consultation based on the revised geographic market definition. Therefore we propose to address those comments, along with any further comments received in response to this consultation, in our statement. However, respondents are invited to make any further submissions on any issue they consider relevant in light of the proposed changes to the market definitions set out above.
- 5.12 In relation to this, we note that there were several comments concerning the period of notice that should apply in exchanges moving from Market 2 to Market 3 during which certain SMP conditions imposed on BT would remain in place⁵⁵. Given that, as a result of this consultation, some additional exchanges are proposed to move from Market 2 to Market 3, and 11 exchanges are proposed to move from Market 1 to Market 3, we seek any additional views from respondents in relation to the period of notice that should apply in these exchanges.

Question 4: *In light of the revised geographic market definition and SMP analysis presented in this consultation, do your previous comments on remedies remain appropriate? If not, please explain why.*

Question 5: *Do you have any further comments to add in relation to remedies in Market 1 and Market 2?*

Question 6: *Do you have any further comments to add in relation to the period of notice that should apply to exchanges that move from Market 2 to Market 3?*

⁵⁵ See paragraphs 5.316 to 5.325 of the first consultation

Annex 1

Responding to this consultation

How to respond

- A1.1 Ofcom invites written views and comments on the issues raised in this document, to be made **by 5pm on Friday 1 October 2010**.
- A1.2 Ofcom strongly prefers to receive responses using the online web form at <http://stakeholders.ofcom.org.uk/consultations/wholesale-broadband-markets/>, as this helps us to process the responses quickly and efficiently. We would also be grateful if you could assist us by completing a response cover sheet (see Annex 3), to indicate whether or not there are confidentiality issues. This response coversheet is incorporated into the online web form questionnaire.
- A1.3 For larger consultation responses - particularly those with supporting charts, tables or other data - please email wba@ofcom.org.uk attaching your response in Microsoft Word format, together with a consultation response coversheet.
- A1.4 Responses may alternatively be posted or faxed to the address below, marked with the title of the consultation.
- Steve Perry
4th Floor
Competition Group
Riverside House
2A Southwark Bridge Road
London SE1 9HA
- Fax: 020 7783 4109
- A1.5 Note that we do not need a hard copy in addition to an electronic version. Ofcom will acknowledge receipt of responses if they are submitted using the online web form but not otherwise.
- A1.6 It would be helpful if your response could include direct answers to the questions asked in this document, which are listed together at Annex X. It would also help if you can explain why you hold your views and how Ofcom's proposals would impact on you.

Further information

- A1.7 If you want to discuss the issues and questions raised in this consultation, or need advice on the appropriate form of response, please contact Steve Perry on 020 7783 4151.

Confidentiality

- A1.8 We believe it is important for everyone interested in an issue to see the views expressed by consultation respondents. We will therefore usually publish all responses on our website, www.ofcom.org.uk, ideally on receipt. If you think your response should be kept confidential, can you please specify what part or whether

all of your response should be kept confidential, and specify why. Please also place such parts in a separate annex.

- A1.9 If someone asks us to keep part or all of a response confidential, we will treat this request seriously and will try to respect this. But sometimes we will need to publish all responses, including those that are marked as confidential, in order to meet legal obligations.
- A1.10 Please also note that copyright and all other intellectual property in responses will be assumed to be licensed to Ofcom to use. Ofcom's approach on intellectual property rights is explained further on its website at <http://www.ofcom.org.uk/about/accoun/disclaimer/>

Next steps

- A1.11 Following the end of the consultation period, Ofcom intends to publish a statement towards the end of 2010.
- A1.12 Please note that you can register to receive free mail Updates alerting you to the publications of relevant Ofcom documents. For more details please see: http://www.ofcom.org.uk/static/subscribe/select_list.htm

Ofcom's consultation processes

- A1.13 Ofcom seeks to ensure that responding to a consultation is easy as possible. For more information please see our consultation principles in Annex 2.
- A1.14 If you have any comments or suggestions on how Ofcom conducts its consultations, please call our consultation helpdesk on 020 7981 3003 or e-mail us at consult@ofcom.org.uk . We would particularly welcome thoughts on how Ofcom could more effectively seek the views of those groups or individuals, such as small businesses or particular types of residential consumers, who are less likely to give their opinions through a formal consultation.
- A1.15 If you would like to discuss these issues or Ofcom's consultation processes more generally you can alternatively contact Vicki Nash, Director Scotland, who is Ofcom's consultation champion:

Vicki Nash
Ofcom
Sutherland House
149 St. Vincent Street
Glasgow G2 5NW

Tel: 0141 229 7401
Fax: 0141 229 7433

Email vicki.nash@ofcom.org.uk

Annex 2

Ofcom's consultation principles

A2.1 Ofcom has published the following seven principles that it will follow for each public written consultation:

Before the consultation

A2.2 Where possible, we will hold informal talks with people and organisations before announcing a big consultation to find out whether we are thinking in the right direction. If we do not have enough time to do this, we will hold an open meeting to explain our proposals shortly after announcing the consultation.

During the consultation

A2.3 We will be clear about who we are consulting, why, on what questions and for how long.

A2.4 We will make the consultation document as short and simple as possible with a summary of no more than two pages. We will try to make it as easy as possible to give us a written response. If the consultation is complicated, we may provide a shortened Plain English Guide for smaller organisations or individuals who would otherwise not be able to spare the time to share their views.

A2.5 We will consult for up to 10 weeks depending on the potential impact of our proposals.

A2.6 A person within Ofcom will be in charge of making sure we follow our own guidelines and reach out to the largest number of people and organisations interested in the outcome of our decisions. Ofcom's 'consultation Champion' will also be the main person to contact with views on the way we run our consultations.

A2.7 If we are not able to follow one of these principles, we will explain why.

After the consultation

A2.8 We think it is important for everyone interested in an issue to see the views of others during a consultation. We would usually publish all the responses we have received on our website. In our statement, we will give reasons for our decisions and will give an account of how the views of those concerned helped shape those decisions.

Annex 3

Consultation response cover sheet

- A3.1 In the interests of transparency and good regulatory practice, we will publish all consultation responses in full on our website, www.ofcom.org.uk.
- A3.2 We have produced a coversheet for responses (see below) and would be very grateful if you could send one with your response (this is incorporated into the online web form if you respond in this way). This will speed up our processing of responses, and help to maintain confidentiality where appropriate.
- A3.3 The quality of consultation can be enhanced by publishing responses before the consultation period closes. In particular, this can help those individuals and organisations with limited resources or familiarity with the issues to respond in a more informed way. Therefore Ofcom would encourage respondents to complete their coversheet in a way that allows Ofcom to publish their responses upon receipt, rather than waiting until the consultation period has ended.
- A3.4 We strongly prefer to receive responses via the online web form which incorporates the coversheet. If you are responding via email, post or fax you can download an electronic copy of this coversheet in Word or RTF format from the 'Consultations' section of our website at www.ofcom.org.uk/consult/.
- A3.5 Please put any parts of your response you consider should be kept confidential in a separate annex to your response and include your reasons why this part of your response should not be published. This can include information such as your personal background and experience. If you want your name, address, other contact details, or job title to remain confidential, please provide them in your cover sheet only, so that we don't have to edit your response.

Cover sheet for response to an Ofcom consultation

BASIC DETAILS

Consultation title:

To (Ofcom contact):

Name of respondent:

Representing (self or organisation/s):

Address (if not received by email):

CONFIDENTIALITY

Please tick below what part of your response you consider is confidential, giving your reasons why

Nothing

Name/contact details/job title

Whole response

Organisation

Part of the response

If there is no separate annex, which parts?

If you want part of your response, your name or your organisation not to be published, can Ofcom still publish a reference to the contents of your response (including, for any confidential parts, a general summary that does not disclose the specific information or enable you to be identified)?

DECLARATION

I confirm that the correspondence supplied with this cover sheet is a formal consultation response that Ofcom can publish. However, in supplying this response, I understand that Ofcom may need to publish all responses, including those which are marked as confidential, in order to meet legal obligations. If I have sent my response by email, Ofcom can disregard any standard e-mail text about not disclosing email contents and attachments.

Ofcom seeks to publish responses on receipt. If your response is non-confidential (in whole or in part), and you would prefer us to publish your response only once the consultation has ended, please tick here.

Name

Signed (if hard copy)

Annex 4

Consultation questions

Sub heading

A4.1 In this consultation we have asked the following questions on which we would like stakeholders to provide their views:

Question 1: *Do you agree with our revised geographic market definition? If not, please explain why.*

Question 2: *In light of the revised geographic market definition presented in this consultation, do your previous comments on SMP remain appropriate? If not, please explain why.*

Question 3: *Do you have any further comments to add in relation to the SMP assessment?*

Question 4: *In light of the revised geographic market definition and SMP analysis presented in this consultation, do your previous comments on remedies remain appropriate? If not, please explain why.*

Question 5: *Do you have any further comments to add in relation to remedies in Market 1 and Market 2?*

Question 6: *Do you have any further comments to add in relation to the period of notice that should apply to exchanges that move from Market 2 to Market 3?*

Annex 5

Updated list of exchanges by market

A5.1 Appendix 1 to 4 to Annex 5 of the first consultation set out the list of BT exchanges by proposed market. The following appendices provide updates to these appendices, based on the proposals in this consultation.

Appendix 1

BT Exchanges In Market 1

3,388 BT Exchanges

CMACK, CMALB, CMALDM, CMALL, CMARM, CMBARF, CMBKN, CMBOB, CMBRAU, CMBRE, CMBWN, CMCLA, CMCLAV, CMCRI, CMCUR, CMDIT, CMEARL, CMELMD, CMETT, CMFIL, CMFRA, CMFUR, CMGREA, CMHAMP, CMHARBU, CMHASN, CMHEN, CMHIG, CMKINE, CMLAP, CMMART, CMMER, CMMID, CMMOR, CMMORT, CMPAI, CMPAT, CMPEB, CMQUA, CMSFD, CMSHE, CMSNI, CMSON, CMSWI, CMTAN, CMWEE, CMWEL, CMWESH, CMWHY, CMWOR, CMWYT, CMYOX, EAABR, EAABY, EAACL, EAALB, EAARD, EAASD, EAASW, EABAC, EABAD, EABAW, EABBY, EABDC, EABDF, EABEY, EABFD, EABFN, EABGC, EABIL, EABIN, EABIR, EABKW, EABLY, EABMF, EABMK, EABNC, EABNM, EABNW, EABOT, EABRD, EABRK, EABRP, EABRR, EABRT, EABSM, EABTM, EABUR, EABUX, EABWL, EABYF, EACAA, EACAR, EACAX, EACDN, EACFD, EACHA, EACHR, EACHT, EACHY, EACLA, EACLE, EACLV, EACOD, EACOG, EACOM, EACOP, EACRO, EACST, EACTD, EACTP, EACTS, EACUL, EACWT, EADEB, EADED, EADIC, EADNE, EADOC, EAEBG, EAEHL, EAELM, EAELS, EAELV, EAERD, EAERI, EAESW, EAETE, EAETK, EAFDM, EAFFD, EAFIN, EAFLE, EAFLT, EAFML, EAFOR, EAFOW, EAFOW, EAFRP, EAFSD, EAFTN, EAFUN, EAFXD, EAFYF, EAGAR, EAGAY, EAGBF, EAGBN, EAGBT, EAGCR, EAGCT, EAGDE, EAGES, EAGHD, EAGHM, EAGHY, EAGLE, EAGMS, EAGOL, EAGRE, EAGRU, EAGRY, EAGSM, EAGST, EAGWH, EAGYD, EAHAT, EAHBK, EAHBO, EAHDM, EAHDN, EAHEA, EAHED, EAHEL, EAHEM, EAHEN, EAHER, EAHEV, EAHGM, EAHC, EAHL, EAHKD, EAHLM, EAHLT, EAHNF, EAHNG, EAHNS, EAHNT, EAHOH, EAHOM, EAHON, EAHOR, EAHOX, EAHRL, EAHRR, EAHST, EAHSW, EAHTM, EAHTT, EAHWO, EAILK, EAISL, EAKBC, EAKEL, EAKEN, EAKSH, EAKSL, EAKTN, EALAV, EALAY, EALIN, EALIT, EALLN, EALOD, EALST, EALTN, EAMAD, EAMBN, EAMEN, EAMET, EAMFD, EAMHD, EAMHM, EAMID, EAMLK, EAMLS, EAMOR, EAMTC, EAMTS, EAMUL, EAMUN, EANAC, EANAR, EANAY, EANDL, EANEE, EANEW, EAOC, EAOF, EAORF, EAORS, EAOUS, EAOVE, EAPEA, EAPEL, EAPEL, EAPOT, EAPRI, EAPUC, EAPUL, EAPUR, EAPYM, EAQUI, EARAD, EARAT, EARAV, EARDH, EARDN, EAREE, EAREN, EARID, EARMS, EAROO, EAROW, EAROX, EASAB, EASAL, EASAP, EASBM, EASBN, EASCK, EASCR, EASFR, EASGM, EASGN, EASHE, EASHI, EASHL, EASHM, EASHR, EASIC, EASIL, EASIX, EASMA, EASMD, EASMN, EASNA, EASOS, EASRM, EASRP, EASRY, EASST, EASTB, EASTK, EASTL, EASTN, EASTR, EASTT, EASTW, EASUR, EASUT, EASWD, EASWL, EASWM, EASWN, EASWT, EASXM, EASXP, EASYD, EATER, EATFD, EATHA, EATHU, EATIV, EATKL, EATLL, EATLW, EATNM, EATOL, EATSC, EATTS, EATWI, EAUBB, EAWAN, EAWBS, EAWCT, EAWEL, EAWEN, EAWFY, EAWIL, EAWIN, EAWIX, EAWKB, EAWLD, EAWLW, EAWLY, EAWMK, EAWOD, EAWOL, EAWOR, EAWRD, EAWRE, EAWRO, EAWRU, EAWSM, EAWSP, EAWST, EAWTL, EAWTS, EAWWR, EAYOX, EMABBOT, EMABRIP, EMALREW, EMALSTO, EMANCAS, EMASFOR, EMBAIN, EMBAKEW, EMBENEF, EMBENWI, EMBGWOR, EMBILLE, EMBILLI, EMBILST, EMBLAKE, EMBLEAS, EMBLISW, EMBLLTO, EMBOTTE, EMBOZEA, EMBRAIL, EMBRIGS, EMBROUG, EMBUCKM, EMBULWI, EMBURGH, EMBURTJ, EMBUTTE, EMBYTHO, EMCABYT, EMCARSI, EMCASTO, EMCHRIS, EMCHSTL, EMCLIFT, EMCLIPS, EMCLOPT, EMCNTON, EMCOGEN, EMCOLLI, EMCOTTE, EMCRANF, EMCRGLN, EMCROWL, EMCROXT, EMCRTON, EMCRWLL, EMCTSCK, EMCULVE, EMCWRS, EMDARLE, EMDEEPI, EMDETHI, EMDFFIE, EMDINGL, EMDNGTN, EMDODDI, EMDOWSB, EMDUDDI, EMEASTB, EMEASTH, EMEASTS, EMEDENH, EMEKKBY, EMELLAS, EMELTON, EMEMPIN, EMESSTL, EMEYEPE, EMFARNS, EMFENTO, EMFLECK, EMFOLKI, EMFOSDY, EMFRIDA, EMFRISK, EMFULBE, EMGADDE, EMGEDNE, EMGILLS, EMGLINT, EMGOSBE, EMGPONT, EMGRETC, EMGRETL, EMGRTFO, EMGRTGL, EMGTTHA, EMGUYHI, EMHACKL, EMHECKI, EMHLLTO, EMHNGTN, EMHOARC, EMHOLSJ,

MYBKE, MYBLU, MYBNS, MYBOL, MYBPI, MYBPM, MYBPW, MYBRE, MYBRN, MYBUB,
 MYBYP, MYCAM, MYCAW, MYCLO, MYCOL, MYCON, MYCOP, MYCOX, MYCRA,
 MYDAL, MYDAR, MYDUN, MYEAO, MYEAT, MYELV, MYESC, MYFLM, MYFLO, MYFLX,
 MYGAT, MYGIL, MYGRA, MYGRE, MYGRG, MYHAC, MYHIR, MYHLI, MYHLM, MYHLP,
 MYHMB, MYHOV, MYHOW, MYHRW, MYHSM, MYHUB, MYHUG, MYHUM, MYKET,
 MYKIL, MYKMP, MYKMS, MYKMZ, MYLAN, MYLAS, MYLEC, MYLIN, MYLOC, MYLON,
 MYMAR, MYMAS, MYMID, MYMLB, MYMMB, MYNVCV, MYNGR, MYNND, MYNSY,
 MYNUN, MYPBG, MYPTN, MYRAM, MYREE, MYRIC, MYRIL, MYRUF, MYRWC, MYSAW,
 MYSBG, MYSDN, MYSET, MYSHF, MYSKR, MYSKS, MYSSN, MYSPD, MYSPU, MYSTI,
 MYSTO, MYSYK, MYTHR, MYTHW, MYTIB, MYTOC, MYTOL, MYWAT, MYWBG,
 MYWEN, MYWEW, MYWHE, MYWHL, MYWIL, MYWIT, MYWLT, MYWOH, NDALD,
 NDALL, NDAPP, NDASH, NDBEC, NDBEN, NDBET, NDBID, NDBOU, NDBRD, NDBRE,
 NDBRG, NDBRI, NDBRK, NDBUR, NDBUX, NDCGA, NDCHA, NDCHD, NDCHI, NDCHL,
 NDCOW, NDCRA, NDCRW, NDCST, NDDHI, NDDOD, NDDPA, NDEAS, NDECH, NDEGE,
 NDELH, NDELM, NDEPE, NDETC, NDFEL, NDFLI, NDFOR, NDFRA, NDFRI, NDFRM,
 NDGOD, NDGOU, NDGUE, NDHAD, NDHAK, NDHAL, NDHAR, NDHDO, NDHED,
 NDHGR, NDHHA, NDHOL, NDHRO, NDHST, NDHUN, NDIDE, NDIHI, NDISF, NDKNO,
 NDLAM, NDLAN, NDLEN, NDLEY, NDLYD, NDLYM, NDMAR, NDMAY, NDMIL, NDMTH,
 NDNEI, NDNEW, NDNIN, NDNOR, NDNUT, NDOTH, NDPEA, NDPEN, NDPET, NDPLA,
 NDPLU, NDRGR, NDROB, NDROT, NDSAH, NDSAD, NDSEI, NDSEL, NDSES, NDSGO,
 NDSHA, NDSHO, NDSHP, NDSMA, NDSMB, NDSMI, NDSTA, NDSTP, NDSVA, NDTEY,
 NDTIC, NDWAD, NDWAT, NDWIN, NDWIT, NDWOO, NDWOR, NDWYE, NEAC, NEAL,
 NEALD, NEALH, NEALS, NEASG, NEBC, NEBED, NEBEL, NEBGM, NEBHM, NEBLA,
 NEBLS, NEBML, NEBNG, NEBRT, NEBU, NEBW, NEBWS, NECAP, NECB, NECBN,
 NECFD, NECHA, NECI, NECOD, NECOT, NECSN, NECST, NECTN, NEDN, NEDP, NEEB,
 NEEGT, NEEHL, NEELA, NEEN, NEFEL, NEFSL, NEFT, NEGLA, NEGMT, NEGND,
 NEGNFD, NEGRE, NEGS, NEGTD, NEGWT, NEHAR, NEHAS, NEHAY, NEHDL, NEHH,
 NEHID, NEHPL, NEHR, NEHSY, NEHTR, NEHWH, NEJV, NEKBW, NEKDR, NEKF, NEKP,
 NELEB, NELK, NELL, NELM, NELO, NELOF, NELT, NEMIL, NEMTD, NENB, NENCT,
 NENH, NENR, NEOM, NEON, NEPB, NEPG, NEPX, NERB, NERD, NEREH, NERFD,
 NERHB, NERM, NESBY, NESDP, NESEH, NESG, NESGT, NESHB, NESK, NESLN,
 NESLS, NESLY, NESNS, NESSDS, NESTA, NESUT, NETL, NETP, NETW, NEUL, NEULM,
 NEWF, NEWGM, NEWH, NEWHD, NEWLL, NEWLW, NEWNS, NEWO, NEWOP, NEWOR,
 NEWR, NEWU, NEWV, NEWYL, NIAA, NIAE, NIAFN, NIAGH, NIAH, NIAL, NIAN, NIAR,
 NIAY, NIBCO, NIBDY, NIBEK, NIBGL, NIBGY, NIBH, NIBK, NIBKB, NIBKR, NIBL, NIBMS,
 NIBN, NIBNA, NIBNB, NIBRA, NIBRN, NIBRS, NIBSB, NIBT, NIBW, NIBWR, NIBY, NICA,
 NICB, NICD, NICDN, NICE, NICG, NICGR, NICH, NICL, NICM, NICMG, NICRH, NICRS,
 NICSD, NICSI, NICUS, NICW, NIDBO, NIDK, NIDL, NIDM, NIDMA, NIDMR, NIDNM,
 NIDOD, NIDPT, NIDQ, NIDR, NIDRY, NIDY, NIDYN, NIFCT, NIFH, NIFIN, NIFN, NIFY,
 NIGF, NIGFD, NIGM, NIGN, NIGT, NIGVA, NIGWY, NIGY, NIHB, NIIM, NIIT, NIJP, NIKA,
 NIKH, NIKL, NIKN, NIKS, NIKTS, NIKVY, NIKY, NIKYL, NILA, NILGL, NILI, NILL, NIMA,
 NIME, NIMFD, NIMH, NIMM, NIMO, NIMOY, NIMTN, NIMZ, NINB, NINH, NIPE, NIPP,
 NIPR, NIPS, NIPT, NIPVE, NIPY, NIRD, NIRL, NIRLN, NIRN, NIRS, NISD, NISEA, NISF,
 NISP, NISTF, NISTN, NISW, NITB, NITC, NITG, NITO, NITP, NITR, NIWD, NIWP, NIWT,
 NSABC, NSABL, NSABO, NSADV, NSAGR, NSAGY, NSALB, NSALF, NSALG, NSALR,
 NSALT, NSALV, NSANG, NSANS, NSAPP, NSARI, NSASC, NSASN, NSASR, NSASS,
 NSATB, NSATL, NSAVI, NSAVR, NSBAC, NSBAD, NSBAY, NSBCS, NSBDI, NSBEA,
 NSBEN, NSBER, NSBET, NSBFD, NSBFR, NSBIG, NSBIR, NSBIX, NSBLD, NSBLL,
 NSBLT, NSBMC, NSBMD, NSBMR, NSBNF, NSBNS, NSBOG, NSBOW, NSBRA, NSBRK,
 NSBRN, NSBRR, NSBRV, NSBRY, NSBSY, NSBTS, NSBVO, NSBVS, NSCAB, NSCAL,
 NSCAN, NSCAR, NSCAT, NSCAW, NSCBK, NSCBS, NSCBY, NSCGM, NSCHL, NSCLN,
 NSCLO, NSCNI, NSCPC, NSCPY, NSCRB, NSCRN, NSCRR, NSCRU, NSCRY, NSCTI,
 NSCTN, NSCTS, NSCTW, NSCTY, NSCUM, NSCUN, NSCWY, NSDAV, NSDBG, NSDBL,
 NSDBT, NSDCH, NSDCR, NSDCT, NSDDL, NSDEE, NSDET, NSDIA, NSDIN, NSDLS,
 NSDLT, NSDMK, NSDMR, NSDNC, NSDNI, NSDNS, NSDOC, NSDPH, NSDRN, NSDRS,

NSDTU, NSDUF, NSDUL, NSDVG, NSDWH, NSEDD, NSEDI, NSEDN, NSEDY, NSERI,
 NSEVA, NSEVI, NSFAG, NSFAR, NSFET, NSFEU, NSFIN, NSFIS, NSFOC, NSFOU,
 NSFRG, NSFRN, NSFSE, NSFSS, NSFTN, NSFYV, NSGAI, NSGBD, NSGBT, NSGDL,
 NSGFN, NSGIL, NSGKD, NSGLA, NSGLG, NSGLV, NSGMT, NSGMZ, NSGOL, NSGOR,
 NSGOS, NSGOT, NSGQT, NSGRE, NSGRN, NSGRO, NSGRV, NSGSL, NSGTN, NSGTY,
 NSGUT, NSGVR, NSHAM, NSHAT, NSHEL, NSHIL, NSHLD, NSHLK, NSHOL, NSHOP,
 NSHOY, NSHRS, NSHRY, NSHUN, NSIGD, NSIGR, NSINS, NSISL, NSIVA, NSIVS,
 NSJOG, NSKBC, NSKCG, NSKCN, NSKDM, NSKDY, NSKED, NSKEM, NSKEN, NSKES,
 NSKGL, NSKGS, NSKHS, NSKIR, NSKIS, NSKLB, NSKLL, NSKLN, NSKLV, NSKLV,
 NSKLN, NSKNO, NSKON, NSKSS, NSKTH, NSKTR, NSKTY, NSKYL, NSLAG, NSLAI,
 NSLAT, NSLBD, NSLBM, NSLCN, NSLER, NSLEV, NSLHA, NSLHP, NSLLT, NSLMD,
 NSLMN, NSLMR, NSLMY, NSLPT, NSLSD, NSLSV, NSLUM, NSLVR, NSLYB, NSLYT,
 NSMAL, NSMAN, NSMAU, NSMDF, NSMEL, NSMEM, NSMER, NSMET, NSMID, NSMIN,
 NSMOF, NSMON, NSMOO, NSMOR, NSMUL, NSMUN, NSNAB, NSNBR, NSNBY,
 NSNDR, NSNER, NSNET, NSNHL, NSNIG, NSNMC, NSNMR, NSNPT, NSNRE, NSNRS,
 NSNST, NSNTT, NSOLL, NSOMD, NSONI, NSORN, NSORP, NSORT, NSOUT, NSPIT,
 NSPLO, NSPMH, NSPON, NSPOO, NSPOY, NSPPS, NSPPW, NSPSY, NSPTR, NSRAA,
 NSREY, NSRHL, NSRHT, NSRHY, NSRMY, NSRNM, NSROG, NSROU, NSRTS, NSRWK,
 NSSAL, NSSAU, NSSBY, NSSCH, NSSCN, NSSCO, NSSCP, NSSDN, NSSDS, NSSDY,
 NSSFR, NSSHA, NSSHI, NSSKB, NSSKD, NSSKL, NSSLI, NSSLW, NSSNS, NSSNV,
 NSSOL, NSSOR, NSSPB, NSSPF, NSSPY, NSSSH, NSSST, NSSSY, NSSTA, NSSTE,
 NSSTF, NSSTH, NSSTM, NSSTN, NSSTR, NSSTU, NSSUL, NSSUM, NSSUN, NSSWL,
 NSSWY, NSSYM, NSTAI, NSTAL, NSTAN, NSTCR, NSTDN, NSTHR, NSTHU, NSTIM,
 NSTKV, NSTLD, NSTON, NSTPH, NSTRD, NSTTL, NSTTN, NSTUL, NSTVS, NSUDN,
 NSUIG, NSULL, NSURR, NSUYE, NSVID, NSVOE, NSWAL, NSWAR, NSWDL, NSWEI,
 NSWFC, NSWHL, NSWIC, NSWNS, NSWRS, NSWRY, NSWSW, NSWTT, NSYTH,
 SDBLCMB, SDBLNY, SDBRCKL, SDBRCMB, SDBRDHM, SDBRGHS, SDBRY,
 SDCHLGR, SDCHLLR, SDCLBRN, SDCLHM, SDCMPTN, SDCWFLD, SDFNDN,
 SDFTTLW, SDFYGT, SDGDSHL, SDGLYND, SDGRFFH, SDGTWCK, SDHMBLD,
 SDHNDCR, SDHRSTM, SDHRTNG, SDHWKLY, SDKRDFR, SDLDSWR, SDFRST,
 SDLNDFL, SDLSS, SDLWRBD, SDLXWD, SDNRWDH, SDNTN, SDPLBRG, SDPLMPT,
 SDPLSTW, SDPRTRD, SDPRVTT, SDPTCHN, SDPTWRT, SDPYNNG, SDRDGWC,
 SDRDNGL, SDRGT, SDRNDL, SDRNGMR, SDRP, SDRSPR, SDRWLND, SDSCYNS,
 SDSDSLH, SDSHNGT, SDSLNDN, SDSLNFL, SDSNGLT, SDSTDN, SDSTMN,
 SDSTMRD, SDSTTN, SDWRNNG, SDWSBRG, SDWSTCH, SDWSTMN, SDWTTNB,
 SDWVLSF, SDYRMTH, SLAF, SLASH, SLBAR, SLBAS, SLBB, SLBBY, SLBHY, SLBLY,
 SLBMB, SLBNB, SLBNN, SLBOB, SLBSM, SLBUS, SLCPL, SLCRM, SLCTR, SLDUA,
 SLED, SLETF, SLFU, SLGD, SLGMN, SLHD, SLHFT, SLHO, SLHS, SLHSN, SLHW,
 SLKHE, SLKKB, SLKL, SLLAU, SLMC, SLMDH, SLMIS, SLMK, SLMLF, SLMTN, SLNBS,
 SLNL, SLNSS, SLNTY, SLNVB, SLOMR, SLOWF, SLPKX, SLRAM, SLRK, SLRXN,
 SLSAS, SLSAU, SLSAY, SLSCA, SLSCK, SLSGO, SLSPD, SLSRB, SLSTU, SLSTW,
 SLSU, SLSWB, SLSWL, SLSWY, SLSXB, SLTE, SLTF, SLTLB, SLTX, SLWCY, SLWEL,
 SLWG, SLWIT, SLWKY, SLWOO, SLWSP, SMAC, SMAD, SMAN, SMATL, SMAW, SMBD,
 SMBDG, SMBEN, SMBG, SMBH, SMBL, SMBNC, SMBRD, SMBRL, SMBRB, SMBTH,
 SMBTN, SMBWY, SMCA, SMCD, SMCDU, SMCHH, SMCHO, SMCHY, SMCI, SMCNR,
 SMCR, SMCRP, SMCRT, SMCTN, SMCWD, SMDD, SMEB, SMEG, SMENS, SMEY,
 SMFB, SMFH, SMFI, SMFN, SMFW, SMGA, SMGB, SMGBL, SMGG, SMGMT, SMGN,
 SMGT, SMGUD, SMHA, SMHDM, SMHE, SMHN, SMHO, SMHPR, SMHS, SMHZ, SMICK,
 SMIMN, SMKX, SMKP, SMLC, SMLD, SMLF, SMLGN, SMLN, SMLR, SMLW, SMMC,
 SMMCM, SMMM, SMMS, SMMSY, SMMY, SMNCY, SMNHM, SMNL, SMNM, SMOL,
 SMPT, SMRE, SMRGT, SMRMN, SMRSL, SMRVN, SMSAN, SMSAY, SMSC, SMSDM,
 SMSE, MSG, MSGN, MSGT, SMSHP, SMSLK, SMSMV, SMSNB, SMSNC, SMSNF,
 MSSO, SMST, SMSTJ, SMSUB, SMSWD, SMSWF, SMSYR, SMTAK, SMTL, SMTN,
 SMTU, SMTY, SMTZ, SMUH, SMWAD, SMWB, SMWHY, SMWKN, SMWLS, SMWNG,
 SMWRB, SMWSN, SMWSW, SMWTC, SMWTW, SMWX, SMWZ, SSABE, SSABS,

SSADN, SSAFD, SSAHY, SSAMB, SSAVY, SSAXB, SSBAD, SSBAL, SSBBG, SSBY, SSBEC, SSBHN, SSBKE, SSBKL, SSBKY, SSBLA, SSBMN, SSBOW, SSBRK, SSBRN, SSBRO, SSBRT, SSBRU, SSBRW, SSBSY, SSCAN, SSCAS, SSCCM, SSCDN, SSCDO, SSCGE, SSCHA, SSCHT, SSCHU, SSCLL, SSCMA, SSCMB, SSCMP, SSCOB, SSCOD, SSCRA, SSCRU, SSDID, SSDIT, SSDYK, SSEDI, SSEVE, SSFAU, SSFBE, SSFFD, SSFIL, SSFRD, SSFTM, SSGBW, SSGPR, SSHAW, SSHIL, SSHPY, SSHUL, SSKEE, SSKEL, SSKFD, SSKLY, SSKMB, SSLAC, SSLAV, SSLBK, SSLHE, SSLIM, SSLKR, SSLOP, SSLTN, SSLUL, SSMAI, SSMAL, SSMAR, SSMEA, SSMIN, SSMLS, SSMSD, SSMWH, SSNCN, SSNLH, SSNRD, SSNTB, SSNUN, SSNWT, SSOAK, SSOGB, SSOVY, SSPEW, SSPLG, SSPLT, SSPOU, SSPRI, SSPTN, SSPWK, SSRAN, SSRBY, SSRMN, SSSAL, SSSBL, SSSEA, SSSEE, SSSFV, SSSHC, SSSHR, SSSHT, SSSOF, SSSRP, SSSTN, SSSUT, SSSWD, SSTBN, SSTEM, SSTRY, SSTTY, SSTWG, SSUFN, SSULY, SSUPT, SSWBT, SSWCE, SSWDH, SSWED, SSWHE, SSWHP, SSWIN, SSWNB, SSWOS, SSWRH, SSWRI, SSWTN, SSWUE, SSWWR, SSWYL, STABTAN, STABTSY, STALDBY, STASHST, STBBSTK, STBDWSR, STBERER, STBEULI, STBMSTR, STBORTN, STBRDCK, STBRFLD, STBRGTN, STBRMDN, STBRNGR, STBROCK, STBSETT, STBUCKH, STBUCKN, STBURLY, STCADNM, STCERNA, STCHBTN, STCHLDO, STCHOLD, STCHSTN, STCOLDC, STCOOMB, STCORFC, STCRANB, STDONHD, STDROXF, STDURLY, STEARLD, STEASTE, STEASTK, STEASTS, STFARLY, STFONTM, STFOVNT, STGRATY, STHANLY, STHAZEB, STHINDN, STHRSLY, STHRSTT, STHTHDN, STICHAB, STIDSTN, STKINGS, STLCKLY, STLNKHT, STLONGB, STLONGP, STLYNST, STMARNL, STMARTN, STMARTX, STMCHDV, STMDNTN, STMERE, STMIDWD, STMILAB, STMILSA, STMORDN, STNETBY, STNETHR, STOWSBY, STOYNWD, STPIDTH, STPUDTN, STPWRST, STROCKB, STROPLY, STSHRTN, STSPSLT, STSSCOT, STSTMBN, STSTOKB, STSTPFD, STSTUDL, STSTURM, STSTURN, STSWAY, STTEFFT, STTISBY, STTOLRY, STTRTHN, STUPAVN, STWALOP, STWESTL, STWESTW, STWEYHL, STWHPSH, STWHTLY, STWINSL, STWITCH, STWLTON, STWRTHM, SWAAI, SWAAV, SWAEN, SWAGL, SWAPO, SWBJY, SWCG, SWCOO, SWCTE, SWCWN, SWDAQ, SWDCP, SWDRW, SWDWQ, SWFBZ, SWFCJ, SWGWN, SWGWR, SWHV, SWJOH, SWKW, SWLAK, SWLAS, SWLCA, SWLCY, SWLDR, SWLDV, SWLGC, SWLHY, SWLJV, SWLKB, SWLKD, SWLKX, SWLKY, SWLLF, SWLLM, SWLLP, SWLLU, SWLLW, SWLNN, SWLPI, SWLQW, SWLY, SWLYA, SWLYJ, SWLYW, SWMAD, SWMDX, SWMF, SWMGX, SWMNF, SWMWY, SWMYE, SWMYG, SWMYU, SWNB, SWNDO, SWNDU, SWNEN, SWNES, SWNNA, SWNTD, SWPBL, SWPEC, SWPEV, SWPHX, SWPM, SWPMQ, SWPOM, SWPQS, SWPRU, SWPTM, SWPUN, SWPYH, SWQCT, SWQFJ, SWQHV, SWQKL, SWQOB, SWQOE, SWRAG, SWRHA, SWRLS, SWRSO, SWRSV, SWSAS, SWSAW, SWSFJ, SWSMX, SWSNI, SWSSQ, SWSVB, SWTAF, SWTB, SWTDE, SWTEK, SWTFS, SWTLL, SWTLU, SWTRH, SWTSA, SWTUC, SWUAH, SWUAZ, SWUCW, SWUGI, SWUGU, SWUHN, SWUTK, SWVLD, SWVW, SWWCP, SWWHT, SWWJK, SWXSX, SWXTP, SWXUU, SWYDU, SWYRO, SWZEN, SWZFR, SWZIU, SWZIY, SWZKA, SWZLD, SWZMX, SWZNR, SWZNT, SWZWJ, SWZYY, SWZZH, THAG, THBC, THBFD, THBL, THBRK, THBT, THCH, THCHD, THCHN, THCKN, THCL, THCMN, THCP, THCY, THDF, THDG, THDM, THED, THEI, THFM, THFN, THFTG, THGO, THGRS, THHC, THHD, THHDY, THHE, THHF, THHN, THHRJ, THHS, THIN, THKB, THKC, THKE, THLM, THLSN, THMD, THMO, THMS, THNB, THNE, THNL, THOK, THOL, THOV, THP, THPC, THPM, THPS, THRD, THRO, THSBN, THSCR, THSE, THSL/UD, THTH, THTI, THTV, THUB, THWA, THWI, THWN, THWT, WMADB, WMADM, WMARL, WMASN, WMAST, WMAUH, WMBAR, WMBBN, WMBDY, WMBET, WMBGM, WMBIS, WMBLA, WMBLO, WMBLS, WMBRA, WMCAM, WMCBM, WMCHA, WMCHM, WMCHS, WMCLO, WMCOL, WMCOT, WMCRO, WMCUT, WMDAP, WMECC, WMECK, WMELM, WMEND, WMFAD, WMFIE, WMGNO, WMGRE, WMHAL, WMHAM, WMHAN, WMHAR, WMHAV, WMHIL, WMHIM, WMHOL, WMHSW, WMINK, WMIPN, WMKEM, WMKLT, WMKNI, WMLEI, WMLOW, WMMAD, WMMIC, WMOAK, WMOMB, WMONE, WMPAX, WMPEO, WMPOW, WMRCR, WMRID, WMROK, WMROM, WMRUD, WMSAN, WMSEI, WMSEV, WMSHB, WMSMA, WMSPE, WMSRK, WMSTA,

WSNEB, WSNEC, WSNEG, WSNEL, WSNES, WSOCH, WSOLD, WSORM, WSPAL,
 WSPAN, WSPAR, WSPAT, WSPEN, WSPIN, WSPIR, WSPOA, WSPOC, WSPOE,
 WSPOP, WSPOR, WSPOW, WSRHU, WSRIN, WSROC, WSSAL, WSSAN, WSSAQ,
 WSSCA, WSSHI, WSSKI, WSSKL, WSSLI, WSSOE, WSSOK, WSSOR, WSSTD, WSSTT,
 WSSTU, WSSYM, WSTAB, WSTAH, WSTAR, WSTAT, WSTAY, WSTHL, WSTIG, WSTIN,
 WSTIR, WSTOB, WSTOD, WSTOR, WSTOW, WSTUR, WSTWE, WSTWY, WSTYN,
 WSULV, WSUPL, WSWAT, WSWHB, WSWHH, WSWHI, WSWIG, WWANST, WWASHB,
 WWASHC, WWASHR, WWASHW, WWBAMP, WWBAWT, WWBCAU, WWBCKL,
 WWBCKN, WWBCLY, WWBDON, WWBEAF, WWBEAW, WWBERE, WWBFAS, WWBIGB,
 WWBKNO, WWBLAG, WWBNYM, WWBOSC, WWBOW, WWBRAN, WWBRAY,
 WWBRDY, WWBREA, WWBROA, WWBROM, WWBRUL, WWBSTM, WWBSTW,
 WWBTON, WWBTOR, WWBURR, WWCAME, WWCANW, WWCARD, WWCARY,
 WWCBIS, WWCKKW, WWCFIT, WWCHAG, WWCHID, WWCHIS, WWCHIT, WWCHIV,
 WWCHLL, WWCHRI, WWCHRM, WWCHUL, WWCLAY, WWCLOV, WWCMAC,
 WWCMAR, WWCOAD, WWCOLY, WWCONS, WWCOPP, WWCORN, WWCORS,
 WWCORT, WWCPOL, WWCRAD, WWCRAL, WWCRAN, WWCROY, WWCRWC,
 WWCSTN, WWCWIC, WWDITT, WWDOBW, WWDOLT, WWDOWN, WWDREW,
 WWDULV, WWDUNS, WWEALL, WWEVER, WWEXBO, WWEXFO, WWEXMN,
 WWFARW, WWFENI, WWFILL, WWFOWE, WWFRAD, WWFROG, WWGARA, WWGERM,
 WWGHAM, WWGRAM, WWGUNN, WWHARB, WWHART, WWHATH, WWHAWK,
 WWHBCK, WWHBCM, WWHCRX, WWHELE, WWHEMY, WWHENL, WWHOLB,
 WWHOLN, WWHOLS, WWHTOR, WWILCH, WWINST, WWIPPL, WWISLE, WWKENN,
 WWKENT, WWKGWR, WWKILK, WWKSTM, WWLAND, WWLANR, WWLAPF, WWLDOW,
 WWLEED, WWLIFT, WWLLAW, WWLODD, WWLOST, WWLSTL, WWLSUT, WWLTRE,
 WWLUPP, WWLVET, WWLWDN, WWLYDF, WWLYNT, WWMABT, WWMARA, WWMARK,
 WWMAWG, WWMBSH, WWMCAN, WWMDAM, WWMEVA, WWMILV, WWMITC,
 WWMLBK, WWMMAG, WWMODY, WWMORT, WWMORW, WWMOUS, WWMPRT,
 WWMSMT, WWMTON, WWMTVY, WWMULL, WWNCAD, WWNCUR, WWNCYR,
 WWNETH, WWNFER, WWNMOL, WWNPTN, WWNPWI, WWNTAM, WWNTAW,
 WWNTCY, WWOAKF, WWOSTN, WWPADS, WWPCMB, WWPIPE, WWPISA, WWPLRN,
 WWPOLP, WWPORL, WWPOST, WWPOUN, WWPRAZ, WWPREA, WWPRIN, WWPSCO,
 WWPTRE, WWPTWN, WWPURI, WWRACK, WWRILL, WWROCH, WWRUMF, WWSAGN,
 WWSALC, WWSAMP, WWSBNT, WWSBUR, WWSCAN, WWSCHD, WWSCIL, WWSCLM,
 WWSCOL, WWSDAY, WWSDOM, WWSENN, WWSFLM, WWSGAB, WWSGEN,
 WWSGER, WWSHAL, WWSHAU, WWSHEB, WWSHIR, WWSIDB, WWSILV, WWSJUS,
 WWSKEV, WWSMAB, WWSMER, WWSMOL, WWSMWG, WWSMWS, WWSOME,
 WWSPAX, WWSTAL, WWSTAR, WWSTAV, WWSTIC, WWSTIT, WWSTOC, WWSTOG,
 WWSTUD, WWSUTT, WWSWIM, WWTEDB, WWTEMP, WWTHRE, WWTIMB, WWTINT,
 WWTLIZ, WWTORX, WWTREB, WWTREG, WWTRES, WWUPOT, WWVERY, WWWASH,
 WWWBAY, WWWCKR, WWWDGT, WWWDWN, WWWEEK, WWWEMB, WWWFRD,
 WWWHEA, WWWHIM, WWWILM, WWWITH, WWWIVE, WWWKLH, WWWMON,
 WWWMOR, WWWOOD, WWWOOL, WWWSHM, WWWZOY, WWYEAL, WWYETM,
 WWZELA

Appendix 2

BT Exchanges In Market 2

660 Exchanges

CLFLE, CLWOO, CMALC, CMBER, CMBIDF, CMBRI, CMCHEY, CMCOD, CMCOLE, CMHILL, CMKVR, CMSMBK, CMSOUC, CMTOL, CMWOL, CMWOM, EAARR, EAATT, EAAYL, EABEC, EABGY, EABLA, EABLU, EABMD, EABND, EABNH, EABRI, EABRU, EABTF, EACAI, EACFH, EACHF, EACLY, EACOX, EACTM, EADIS, EADNM, EADSM, EAELC, EAEMS, EAEXN, EAFAK, EAFME, EAFUL, EAGDM, EAGIR, EAGWK, EAHAS, EAHET, EAHIS, EAHOL, EAHSD, EAHUL, EAING, EALAK, EALAT, EALNT, EALPT, EALWT, EAMAN, EAMKT, EANPT, EANWD, EANWS, EAONG, EAORM, EAPAK, EASCI, EASFM, EASFT, EASOH, EASTD, EASWV, EATEV, EATHE, EATIP, EATRU, EAWAS, EAWDB, EAWDF, EAWIV, EAWLM, EAWMS, EAWRI, EAWTB, EAWTN, EAWYM, EMALFRE, EMAMBER, EMASBOU, EMASHBB, EMATTHE, EMBARTO, EMBELPE, EMBINGH, EMBOSTO, EMBREAD, EMBRIXW, EMBUCKD, EMBYFIE, EMCHATT, EMCOTGR, EMDDESBO, EMDRAYC, EMDSSFO, EMEARLS, EMEDWIN, EMESTLE, EMETWLL, EMFINED, EMHLBCH, EMHORSL, EMHURLE, EMIBSTO, EMIRTHL, EMLSUTT, EMLUTTE, EMMATLO, EMMESHM, EMMKFIE, EMOAKHA, EMOVERS, EMPLUMT, EMQURRN, EMRADCL, EMRMSEY, EMROTHW, EMRPTON, EMSAWTR, EMSKGNS, EMSLEBY, EMSLFRD, EMSOSH, EMSOUTH, EMSPCOT, EMTBSHE, EMTHRAP, EMTUTBU, EMWEDDO, EMWIRKS, ESALV, ESBK, ESBALR, ESBLY, ESBUR, ESCAR, ESCUP, ESDUN, ESDUR, ESDYS, ESFAU, ESGAL, ESHAD, ESHAR, ESIKR, ESKEL, ESKIN, ESKLY, ESKRL, ESKRM, ESLCG, ESLOC, ESMNF, ESMON, ESNML, ESNOA, ESNRB, ESPEB, ESSCN, ESSTA, ESTAY, ESTIL, ESWCA, ESWIN, LCADL, LCASL, LCASP, LCBAN, LCCAF, LCCOP, LCDTF, LCEAR, LCECC, LCEGR, LCGAR, LCHAM, LCHAR, LCHET, LCKES, LCKNO, LCMLM, LCPAR, LCULV, LCWGT, LCWHA, LCWIN, LNCNW, LNPKS, LSTAD, LSWOL, LVAUG, LVHAL, LVHIG, LVWTW, LWCHO, LWDEN, LWHARE, MRALD, MRBOL, MRCHA, MRDIS, MRMOT, MRNEW, MRSAN, MRWEA, MRWHA, MYBOR, MYBOS, MYBRW, MYCAY, MYCRF, MYCSH, MYCTN, MYCUL, MYDFF, MYDLT, MYFIL, MYHEB, MYHIP, MYHNS, MYKEY, MYLEV, MYMAL, MYOAT, MYPIC, MYPOC, MYRPP, MYSTR, MYTAD, MYTHT, MYWAY, NDBAL, NDBAT, NDBG, NDBIR, NDCAS, NDCDO, NDCHR, NDCLI, NDCOO, NDDYM, NDEDE, NDFAI, NDFRO, NDHAW, NDHIL, NDLIN, NDLOO, NDMEO, NDNON, NDOTF, NDPEM, NDRYE, NDSAN, NDSEA, NDSML, NDSOU, NDSTU, NDTEN, NDWES, NDWET, NDWKI, NEAM, NEAW, NEBDL, NEBEA, NEBRO, NEBUR, NECC, NECOX, NECR, NEDUDL, NEE, NEES, NEGA, NEGM, NEHYL, NELC, NEMEA, NEOC, NERG, NERN, NESAC, NESFE, NESH, NESH, NESLB, NESTK, NESTO, NETI, NETMN, NEWAU, NEWHY, NEWLF, NEWN, NEWT, NIBNH, NIBO, NICDY, NICF, NICI, NICK, NICLK, NICMN, NICN, NICR, NIDD, NIDG, NIDO, NIDP, NIDV, NIEG, NIEK, NIHO, NIHW, NIKI, NILY, NIMF, NIMR, NINE, NINS, NIOM, NIRI, NIRT, NISE, NISM, NISTM, NSBBN, NSBCY, NSBDS, NSBKI, NSCTR, NSDGW, NSDYC, NSFRA, NSFRS, NSFWM, NSICL, NSIMD, NSIUR, NSLOS, NSNAI, NSPET, NSPRT, NSSVN, NSTUR, SDBLLNG, SDBMBRD, SDBSHM, SDCWS, SDFRSHW, SDHNFLD, SDHRSTP, SDHSSCK, SDMDDL, SDMDHRS, SDNWPRT, SDPGHM, SDPLGT, SDPVNSM, SDSHNL, SDSLSY, SDSTRGT, SDSTRRN, SDVNTNR, SDWCKHM, SDYPTN, SLASK, SLBAW, SLBEN, SLBWH, SLCBY, SLCL, SLCLY, SLEK, SLEP, SLFGY, SLHC, SLHLY, SLHX, SLLH, SLMIM, SLMT, SLRSN, SLRU, SLSKT, SLSPK, SLWAD, SLWBO, SLWHT, SLXDS, SMBC, SMBZ, SMCBY, SMCHN, SMCN, SMFRD, SMHXT, SMKBN, SMLA, SMLSN, SMNPL, SMOA, SMOY, SMPRB, SMRDB, SMROW, SMSA, SMSFD, SSMH, SMTA, SMWC, SMWEP, SMWLY, SMWS, SMWTD, SMWW, SMYG, SSBAN, SSBAT, SSBLE, SSBOA, SSBOX, SSBRI, SSCDR, SSCIN, SSCOL, SSCOR, SSCRD, SSDBK, SSSDY, SSSFGN, SSFLA, SSSGLA, SSHGH, SSSLDY, SSLON, SSMBH, SSNAH, SSPIL, SSSFD, SSSHM, SSSHN, SSSTT, SSSTIM, SSWEL, SSWG, SSWTC, SSWWS, SSSYAT, STALSFD, STAMSBY, STBINAB, STBLFRD,

STBRDPT, STCANCL, STDOWTN, STDURRW, STFORDB, STGILGM, STLGSHL, STMILOS, STPORTL, STPRSTN, STSHABY, STSWANG, STTDWTH, STTWYFD, STUPWEY, STWARHM, STWEYMH, STWRMWL, SWABT, SWBII, SWBIK, SWBNB, SWBSE, SWBUD, SWCAA, SWCNE, SWCT, SWCXX, SWGAR, SWGBG, SWHJL, SWLLG, SWMES, SWMGR, SWMU, SWNSN, SWPDW, SWPTY, SWQTI, SWRHR, SWRRY, SWSDV, SWTAJ, SWTAT, SWUWN, SWYBL, SWZWM, THAFD, THBG, THCDN, THCLY, THDC, THEV, THEY, THH, THHH, THHW, THLP, THMSD, THOH, THSPD, THTAD, THTG, THWL, THWTH, THWY, WMADY, WMASH, WMBAD, WMBEW, WMHAG, WMHCH, WMLIT, WMMAL, WMPER, WMPKR, WMSTU, WMUTT, WNABC, WNAGE, WNBC, WNBG, WNBH, WNBRS, WNBT, WNCA, WNCB, WNCHK, WNCHR, WNDEN, WNDON, WNELL, WNGRE, WNHAT, WNHLN, WNHOL, WNLDD, WNLED, WNLEO, WNLGF, WNLR, WNLUD, WNMB, WNMD, WNMW, WNNN, WNOC, WNOSW, WNPEG, WNROS, WNROW, WNRUA, WNRUT, WNSA, WNSHI, WNVAL, WNWCH, WNWEM, WNWPL, WSALL, WSBIN, WSBOT, WSCAS, WSCLE, WSDAL, WSDAR, WSDAV, WSDUN, WSGAL, WSGIR, WSGLG, WSGRT, WSLAK, WSLEX, WSMAU, WSOBA, WSPTH, WSPTN, WSROT, WSSTO, WSSTR, WSWEK, WSWEM, WWAXMI, WWBARN, WWBIDE, WWBLYD, WWBRAU, WWBTRA, WWBUDE, WWBUDL, WWCALL, WWCHEL, WWCHRD, WWCHUD, WWCRED, WWCREW, WWCULL, WWDART, WWDRAN, WWHOLF, WWHONI, WWILMI, WWKKWL, WWKNGB, WWLAUN, WWLISK, WWLOOE, WWLPRT, WWLYME, WWMART, WWMINE, WWOKEH, WWOSMY, WWPAR, WWPERR, WWPRYN, WWROBO, WWSEAT, WWSHER, WWSIDM, WWSIVE, WWSOWT, WWSPET, WWSTEN, WWTAVI, WWTOPS, WWTORR, WWTOTN, WWTPTNT, WWWADE, WWWELL, WWWILL, WWWINC, WWYELV, WWYEOV

Appendix 3

BT Exchanges In Market 3

1,539 Exchanges

CLBER, CLBIS, CLCAN, CLCLE, CLCOV, CLEUS, CLFAR, CLHOL, CLKEN, CLKLG, CLKXX, CLOW, CLMON, CLMOO, CLNEW, CLSHO, CLSOU, CLSTE, CLUPP, CLWAL, CLWAP, CMACO, CMALD, CMASHF, CMASTX, CMBEAC, CMBEAR, CMBED, CMBIL, CMBIN, CMBIR, CMBLAC, CMBNW, CMBRO, CMBRU, CMBYL, CMCAL, CMCAN, CMCAS, CMCEN, CMCGF, CMCHAP, CMCHEL, CMCHY, CMCRA, CMDD, CMDRU, CMDUN, CMEARD, CMEAS, CMEDG, CMERD, CMEXH, CMFAL, CMFIN, CMFOL, CMFOR, CMFOU, CMGREB, CMHALE, CMHARBO, CMHEA, CMHED, CMHIGH, CMHIGW, CMHOR, CMJAM, CMKEN, CMKER, CMKING, CMKNO, CMKWD, CMLEA, CMLGS, CMLIC, CMLYE, CMMLD, CMNOR, CMNUN, CMPEL, CMPEN, CMPRI, CMRAD, CMREC, CMRUB, CMRUGB, CMSED, CMSEL, CMSHEL, CMSHI, CMSME, CMSOL, CMSOUB, CMSPR, CMSTB, CMSTE, CMSTOX, CMSTRA, CMSTRE, CMSUT, CMTET, CMTIL, CMTIP, CMVIC, CMWAL, CMWARW, CMWDGT, CMWED, CMWESB, CMWIL, CMWL, CMWV, EABAS, EABCY, EABEL, EABIS, EABNT, EABOR, EABRW, EABSE, EACAM, EACHE, EACHU, EACLN, EACOL, EACOS, EACRH, EACVI, EADAN, EADER, EADOW, EADRA, EAEBY, EAELY, EAEP, EAEP, EAEP, EAEP, EAFEL, EAFIX, EAFRN, EAGBD, EAGOR, EAGRA, EAGYT, EAHAE, EAHAV, EAHAW, EAHLW, EAHTF, EAHWD, EAHWH, EAIPS, EAKLN, EAKSG, EALAI, EALGH, EALOW, EAMAL, EAMIL, EAMRN, EANBF, EANCC, EANCN, EANCW, EANMK, EARAY, EAROC, EARST, EASAF, EASBF, EASBW, EASBY, EASND, EASTF, EASTM, EASUD, EASWO, EATHB, EATHP, EATLB, EAVAN, EAWAR, EAWFD, EAWHI, EAWTH, EMALLES, EMALVAS, EMARKWR, EMARNOL, EMAYLES, EMBASFO, EMBEAUM, EMBEEST, EMBELGR, EMBIRSS, EMBLDWO, EMBOURN, EMBRAUN, EMBRLAT, EMBULWE, EMBURTO, EMCASTL, EMCENTL, EMCHALF, EMCHAPE, EMCHELL, EMCOALV, EMCRRBY, EMDAVEN, EMDRRBB, EMDUSTO, EMEASWI, EMEDWAL, EMERRSS, EMEVING, EMFAZEL, EMGDDLI, EMGLNFI, EMGRETO, EMGRHAM, EMGSCTE, EMHARDI, EMHARRO, EMHINCK, EMHNDON, EMHUCKN, EMILKES, EMKIMBE, EMKINGS, EMKIRKB, EMKRBYM, EMKTTER, EMLANGL, EMLLEABR, EMLGHBO, EMLONGB, EMLONGE, EMMAARC, EMMELTN, EMMICKL, EMMKDEE, EMMNSFI, EMMONTF, EMMOULT, EMMRKT, EMNARBO, EMNEWAR, EMNEWOL, EMNORTH, EMOODBY, EMORTON, EMPETER, EMPINXT, EMPOLSW, EMPRTRE, EMRANND, EMRDDIN, EMRPLEY, EMRTHLY, EMRUSHD, EMSANDI, EMSHEPS, EMSHIRE, EMSHRWO, EMSPDNG, EMSTBBS, EMSTIVE, EMSTMFD, EMSTNEO, EMSTNYG, EMSTTEL, EMSUTTI, EMSWADL, EMTHRNB, EMTMWOR, EMTOWCE, EMTRENT, EMWARSO, EMWELLI, EMWERRI, EMWESSW, EMWESTO, EMWHITT, EMWILLO, EMWOLLA, EMWSBCH, EMWSTWO, EMYXLEY, ESABB, ESALL, ESARB, ESARM, ESAN, ESBAT, ESBAX, ESBON, ESBRF, ESBRO, ESBUC, ESBYB, ESCAU, ESCLA, ESCOC, ESCOR, ESCOW, ESCRA, ESCTN, ESDAB, ESDAL, ESDAV, ESDEA, ESDEN, ESDON, ESDUF, ESFAI, ESFAL, ESFFR, ESFML, ESFOU, ESGLC, ESGLN, ESGLS, ESGRA, ESGRB, ESGRG, ESIKG, ESKIR, ESKNW, ESLAR, ESLEI, ESLEV, ESLIB, ESLNW, ESLOA, ESLVB, ESLVS, ESMAL, ESMAY, ESMID, ESMOR, ESMUS, ESNEW, ESPAR, ESPCK, ESPEN, ESPER, ESPOL, ESPOR, ESQUE, ESROS, ESSHO, ESSTI, ESTNT, ESWAV, ESWHA, ESWHI, LCACC, LCAIM, LCAIN, LCAOR, LCAPB, LCASB, LCATH, LCBAB, LCBAC, LCBAR, LCBIR, LCBLK, LCBLP, LCBOL, LCBRN, LCBUR, LCBUS, LCCAR, LCCHO, LCCHU, LCCLE, LCCLR, LCCLV, LCCOC, LCCOL, LCDAR, LCDAU, LCFAR, LCFLW, LCFOM, LCFRE, LCFUL, LCGRH, LCHBK, LCHEW, LCHEY, LCHIG, LCHIN, LCHOR, LCKEN, LCKHA, LCLAN, LCLAY, LCLEI, LCLEY, LCLIT, LCLON, LCLOT, LCLYT, LCMAR, LCMAT, LCMOR, LCNEL, LCNSH, LCCORR, LCPAD, LCPEN, LCPPEW, LCPLB, LCPLP, LCPOU, LCPRE, LCRAM, LCRIB, LCROC, LCROS, LCSHW, LCSOU, LCSSH, LCSTA, LCSTD, LCTOD, LCTOT, LCWAL, LCWES, LCWHI, LCWIG, LCWIL, LCWOR, LNADK, LNBAR,

LNBGN, LNBKG, LNBPK, LNCED, LNCHF, LNCLA, LNCUF, LNDAG, LNEDM, LNENF, LNFIN, LNGDM, LNGHL, LNHAC, LNHAI, LNHAT, LNHOD, LNHOR, LNHPK, LNILC, LNILN, LNING, LNLEY, LNLOU, LNLVY, LNMED, LNMUS, LNNFN, LNNWS, LNPFT, LNPGN, LNPON, LNPOP, LNPOT, LNRAI, LNROM, LNSOK, LNSTA, LNSTB, LNSTF, LNTOT, LNUPK, LNUPM, LNWCR, LNWFD, LNWGN, LNWIN, LNWSD, LNWTH, LSADD, LSASH, LSBAL, LSBEC, LSBEU, LSBEX, LSBKM, LSBRO, LSBURH, LSBYF, LSCHER, LSCHES, LSCHI, LSCLPM, LSCOB, LSCRAY, LSCRO, LSCTFD, LSCTHM, LSDAR, LSDEP, LSDOW, LSDUL, LSELT, LSEPSM, LSERI, LSESH, LSEWE, LSFARB, LSFARN, LSFOR, LSGIP, LSGRNH, LSGRNW, LSGRO, LSHAY, LSKID, LSKIN, LSLEA, LSLEE, LSLODH, LSMAL, LSMEPK, LSMERS, LSMIT, LSMOL, LSMOR, LSNCHM, LSNOR, LSORP, LSPUR, LSPUT, LSRED, LSREI, LSRIC, LSRUS, LSSAN, LSSID, LSSLA, LSSTR, LSSUN, LSSUR, LSSUT, LSSWA, LSSYD, LSTED, LSTHDT, LSTHMD, LSTHO, LSTUL, LSUWAR, LSWAL, LSWAN, LSWEY, LSWIM, LSWLTN, LSWOO, LSWOR, LSWWKM, LVAIN, LVALL, LVANF, LVARR, LVBIL, LVBIR, LVBOO, LVBRO, LVCAL, LVCEN, LVCHI, LVCLA, LVCRE, LVCUL, LVEAS, LVELL, LVFRO, LVGAT, LVGRE, LVHEL, LVHES, LVHOO, LVHOY, LVHUN, LVHUY, LVIRB, LVLAR, LVLYM, LVMAG, LVMOU, LVMSX, LVNES, LVNET, LVNLW, LVNOR, LVORM, LVPAD, LVPEN, LVPRE, LVRAI, LVRNE, LVRNM, LVROC, LVROY, LVSAI, LVSEF, LVSIM, LVSKY, LVSTA, LVSTK, LVSTO, LVUPH, LVWAL, LVWAR, LVWAT, LVWID, LWACT, LWASH, LWBUS, LWCHI, LWCOL, LWCRI, LWEL, LWEDG, LWEGH, LWELS, LWFEL, LWGAR, LWGOL, LWGRE, LWHAM, LWHARL, LWHARR, LWHT, LWHAY, LWHEN, LWHOU, LWISL, LWKGRE, LWKIN, LWKLAN, LWKNE, LWKROA, LWMIL, LWNEDG, LWNOR, LWNWEM, LWNWOO, LWPER, LWPIN, LWRAD, LWRIC, LWRUI, LWSHAR, LWSHE, LWSKY, LWSOU, LWSTAI, LWSTAN, LWTWI, LWUXB, LWWAT, LWWDRA, LWWEM, LWWIL, MRALT, MRARD, MRASH, MRBLA, MRBRA, MRBRO, MRBUR, MRBUX, MRCEN, MRCHE, MRCHO, MRCOL, MRCON, MRDEN, MRDID, MRDRO, MREAS, MRECC, MRFAI, MRGAT, MRGLO, MRHAR, MRHEA, MRHUL, MRHYD, MRIRL, MRKNU, MRLON, MRMAC, MRMAR, MRMDW, MRMER, MRMID, MRMOS, MRMSL, MRNOR, MROLD, MRPEN, MRPOY, MRPRE, MRRAD, MRRIN, MRRUS, MRSAD, MRSAL, MRSTA, MRSTE, MRSTO, MRSWI, MRTRA, MRURM, MRWAL, MRWHI, MRWIL, MRWIN, MRWOO, MRWYT, MYACO, MYADE, MYARM, MYBAT, MYBD, MYBIN, MYBNN, MYBRG, MYCAL, MYCAS, MYCHA, MYCLE, MYCSG, MYDEW, MYDHS, MYDUD, MYELL, MYGOO, MYGRF, MYGUI, MYHAL, MYHAW, MYHAX, MYHBK, MYHEA, MYHEC, MYHGT, MYHHL, MYHLT, MYHMF, MYHMW, MYHOB, MYHON, MYHSF, MYHUD, MYIDL, MYILK, MYILL, MYKEI, MYKKB, MYKNA, MYKNO, MYLAI, MYLOF, MYLOW, MYLS, MYMAN, MYMIL, MYMIR, MYMOO, MYMOR, MYMSG, MYMTH, MYNMN, MYOTL, MYPON, MYPUD, MYQUE, MYROT, MYRPN, MYRWD, MYSAN, MYSCA, MYSEA, MYSEL, MYSEM, MYSHI, MYSKE, MYSKP, MYSLA, MYSM, MYSNH, MYSOW, MYSRB, MYSTE, MYTHN, MYUND, MYWAK, MYWEH, MYYO, NDACO, NDAGR, NDASF, NDAYL, NDBAR, NDBEA, NDBEX, NDBHI, NDBLH, NDBRO, NDCAN, NDCHE, NDCHS, NDCOP, NDCRO, NDDEA, NDDOV, NDEGR, NDFAV, NDFOL, NDGIL, NDGRA, NDHAS, NDHBA, NDHEA, NDHOO, NDHYT, NDLON, NDMAI, NDMED, NDMSH, NDNRO, NDOXT, NDPWO, NDRAI, NDRAM, NDSEV, NDSHE, NDSIT, NDSNO, NDSTR, NDTHA, NDTON, NDTWE, NDUCK, NDWHI, NDWMA, NEAT, NEAYC, NEB, NEBA, NEBDT, NEBH, NEBL, NEBO, NEBR, NECM, NECN, NECT, NED, NEDB, NEDL, NEDU, NEEC, NEEHN, NEESG, NEF, NEFH, NEFN, NEG, NEGF, NEGHD, NEHAL, NEHHL, NEHLS, NEHRT, NEHT, NEHZ, NEILB, NEJ, NEJW, NEK, NEKI, NEL, NELF, NELIN, NEMI, NEMP, NEMTN, NENA, NENN, NENP, NENS, NENT, NENTE, NENTW, NEP, NEPH, NEPTE, NERC, NERE, NERT, NES, NESAI, NESHM, NESP, NESS, NESTN, NESU, NESUN, NESVL, NEW, NEWAS, NEWB, NEWHP, NEWK, NIAM, NIAT, NIBA, NIBB, NIBC, NIBM, NIBML, NIBRH, NIBYS, NIC, NICRG, NICTY, NIDLD, NIEAS, NIFWM, NIGGY, NIKNK, NILD, NILDW, NILE, NILG, NILN, NIMAL, NINTH, NINTS, NINY, NIORM, NIPO, NIWBY, NSASH, NSBLG, NSDEN, NSELG, NSELL, NSKGW, NSKNC, NSLNG, NSNTH, NSWES, SDBGNRR, SDBRGSS, SDCHCHS, SDCRWLY, SDCSHM, SDESTBR, SDFRHM, SDGSPRT, SDHLSHM, SDHMPDN, SDHRLY, SDHRNDN, SDHRSHM, SDHV, SDHVNT, SDHYLNG, SDHYWRD, SDKMPTW, SDLNCNG, SDLSLNT,

SDLTTLH, SDLWS, SDMSWRT, SDNWHVN, SDPCHVN, SDPCNTC, SDPNDHL,
 SDPNRTH, SDPRTSL, SDPTRSF, SDPVNSY, SDRSTNG, SDRTTNG, SDRYD, SDSFRD,
 SDSHRHM, SDSNDWN, SDSTBBN, SDSTHWC, SDSTHWT, SDSTYNN, SDTTCHF,
 SDWCNTR, SDWSWND, SDWTHDN, SDWTRLV, SDWWST, SLAC, SLADK, SLARM,
 SLASC, SLBAL, SLBC, SLBCC, SLBH, SLBLR, SLBOI, SLBWD, SLBY, SLBYD, SLCBR,
 SLCD, SLCLS, SLCUD, SLCX, SLDC, SLDCN, SLDF, SLDIO, SLDR, SLEF, SLGB, SLGL,
 SLGTP, SLGY, SLHBE, SLHLG, SLHTW, SLHWD, SLHY, SLHYG, SLIMM, SLIN, SLKIV,
 SLLI, SLMBY, SLMEX, SLMOS, SLNCU, SLOB, SLOLD, SLPN, SLRF, SLRH, SLRHN,
 SLRN, SLRWM, SLRY, SLSC, SLSEK, SLSF, SLST, SLSW, SLSY, SLTHY, SLTKL, SLWB,
 SLWD, SLWKT, SLWKZ, SLWL, SLWM, SLWS, SLWTH, SLWW, SMAI, SMAM, SMAP,
 SMAY, SMBA, SMBB, SMBCD, SMBF, SMBI, SMBK, SMTB, SMBU, SMBWD, SMBY,
 SMCAR, SMCB, SMCOC, SMCOSH, SMCDB, SMCDC, SMFK, SMGM, SMHD, SMHGN, SMHH,
 SMHI, SMHR, SMHUR, SMHY, SMKI, SMKO, SMKT, SMLBD, SMLEA, SMLH, SMLT,
 SMNP, SMOF, SMPEN, SMSM, SMSSF, SMSTF, SMSU, SMSX, SMTR, SMWE, SMWI,
 SMWN, SMWV, SSALM, SSAVO, SSBBN, SSBCL, SSBED, SSBIS, SSBIT, SSBWD,
 SSCAL, SSCBD, SSCHI, SSCHN, SSCIR, SSCLE, SSCMN, SSSY, SSDEV, SSDOW,
 SSEAS, SSEAV, SSFIS, SSFLT, SSFRO, SSGLR, SSHEN, SSHWK, SSKEY, SSKMD,
 SSKWD, SSMEL, SSMID, SSNAI, SSNOR, SSPOR, SSRAD, SSRED, SSSHE, SSSOU,
 SSSSM, SSSTD, SSSTO, SSSWN, SSTHL, SSTHO, SSTRO, SSTXY, SSWAR, SSWES,
 SSWHI, SSWIB, SSWOB, SSWOR, SSWOT, SSWSM, STANDVR, STBDSTN, STBISHW,
 STBLNFD, STBNMTH, STBOSMB, STBOTLY, STBURSN, STCFORD, STCHRCH,
 STDORCH, STEASTL, STFAIRO, STFAWLY, STFERND, STHAMBL, STHICLF,
 STHMPTN, STHRSTK, STHYTHE, STLOCKH, STLYMTN, STLYTMN, STMRHLL,
 STNEWMN, STNTHBN, STPOOLE, STPRKST, STRINGW, STROMSY, STRWNMS,
 STSALIS, STSHRLY, STSOTON, STSTHBN, STTOTTN, STVERWD, STWIMBN,
 STWINCH, STWINTN, STWLSTN, STWSTBN, SWAA, SWAAZ, SWABD, SWADW, SWAG,
 SWAVY, SWBIG, SWBNP, SWBPG, SWCAB, SWCFATE, SWCFK, SWCIT, SWCJ,
 SWCJW, SWCRS, SWCUV, SWCYX, SWDPW, SWEBY, SWFBX, SWGBY, SWGC,
 SWGLN, SWHXM, SWKGH, SWLJ, SWLJZ, SWLLD, SWLLO, SWLLR, SWLNI, SWMAL,
 SWMDE, SWMLZ, SWMMN, SWMMV, SWMT/EX, SWMYS, SWNBI, SWNE/CH,
 SWNE/EX, SWNM, SWNVW, SWOAG, SWPBM, SWPDU, SWPEK, SWPEU, SWPN,
 SWPND, SWPP, SWPTB, SWPTH, SWQJA, SWRDA, SWRDX, SWRTH, SWRVH,
 SWRWI, SWSKJ, SWSKU, SWSX, SWSZX, SWTDU, SWTEZ, SWTFA, SWTR, SWTRF,
 SWWXC, SWXNH, SWYYN, SWZKS, THAD, THAS, THATN, THBA, THBEN, THBK, THBN,
 THBO, THBR, THBW, THBZ, THC, THCK, THCN, THCV, THCW, THDK, THEAR, THFB,
 THFC, THFJ, THFT, THGG, THGI, THGX, THHM, THHT, THIP, THLG, THLL, THM, THML,
 THNU, THRG, THS, THSL, THT, THTF, THTT, THWDY, THWK, THWM, THWO, THWP,
 THWR, THY, WEWBAY, WEWBLO, WEWHAM, WEWLOR, WEWMAI, WEWMAR,
 WEWMAY, WEWNPN, WEWPAD, WEWPRI, WEWSOH, WMALS, WMBID, WMBLY,
 WMBPZ, WMBUR, WMCHD, WMCIT, WMDIM, WMDRO, WMEV, WMFER, WMHAS,
 WMHX, WMIPS, WMKD, WMKDG, WMLEE, WMLON, WMMFD, WMMTL, WMNAN,
 WMNEW, WMRJ, WMRUG, WMSBH, WMSPA, WMSTJ, WMSTK, WMSTO, WMSTP,
 WMTRE, WMWLN, WMWR, WNBUC, WNCKO, WNCSC, WNCNS, WNCSS, WNDAW,
 WNDEE, WNFL, WNHAW, WNHR, WNHW, WNM, WNNP, WNOAK, WNPRS, WNRE,
 WNRWX, WNSTI, WNSY, WNWEL, WNWX, WNWXN, WRBATT, WRBEL, WRBRIX,
 WRCHL, WRECT, WRFULM, WRKGDN, WRNELMS, WRPGRN, WRPIM, WRSKEN,
 WRSLO, WRSTHBK, WRVAUX, WRWHI, WRWKEN, WRWMIN, WSAIR, WSALE, WSANN,
 WSARD, WSAYR, WSBAL, WSBAR, WSBEA, WSBEH, WSBEI, WSBEL, WSBI, WSBLA,
 WSBRE, WSBR, WSBRW, WSBUS, WSCAB, WSCAM, WSCAR, WSCEN, WSCLY,
 WSCMN, WSCOA, WSCRA, WSCRO, WSCUM, WSDMS, WSDOU, WSDRU, WSDUM,
 WSDUT, WSEKI, WSERS, WSGIF, WSGOU, WSGOV, WSGRE, WSHAL, WSHAM,
 WSHL, WSHOL, WSIBR, WSIRS, WSIRV, WSJOH, WSKBN, WSKIE, WSKIL, WSKIR,
 WSKIW, WSKIY, WSLAA, WSLAN, WSLAR, WSLES, WSMAR, WSMER, WSMIL, WSMOT,
 WSNEW, WSPA, WSPOL, WSPOS, WSPRE, WSPRO, WSREN, WSRUT, WSSCO,
 WSSHE, WSSOU, WSSPR, WSSTE, WSSTN, WSSTW, WSTHO, WSTRO, WSUDD,

WSWES, WSWIS, WWBODM, WWBRIX, WWBURN, WWBWAT, WWCAMB, WWCHRS,
WWCRWN, WWDAWL, WWDPRT, WWEXMO, WWEXTR, WWFALM, WWHAYL,
WWHELPS, WWILFR, WWIVYB, WWNABB, WWNANP, WWNEWQ, WWPAIG, WWPENZ,
WWPINH, WWPSTK, WWPTON, WWPYTH, WWREDR, WWSALT, WWSAUS, WWSBUD,
WWSHIP, WWSMAR, WWTAUN, WWTEIG, WWTIVE, WWTORQ, WWTRUR

Appendix 4

BT Exchanges moving from Market 1 or Market 2 to Market 3

349 Exchanges

CLMOO, CMFIN, CMJAM, CMKER, CMKNO, CMMLD, EACHU, EACOS, EADAN, EADER, EADOW, EADRA, EAEPP, EAFRN, EAGBD, EAGYT, EAHAE, EAHAW, EAHWH, EAKSG, EAMIL, EAROC, EASAF, EASBY, EASUD, EASWO, EATHB, EMBIRSS, EMBOURN, EMBRLAT, EMCHELL, EMHARDI, EMKIMBE, EMKRBYM, EMMKDEE, EMNEWOL, EMRANND, EMRPLEY, EMRTHLY, EMSHEPS, EMSHIRE, EMSTTEL, EMTOWCE, EMWARSO, EMYXLEY, ESARB, ESARM, ESBAX, ESBON, ESBUC, ESBYB, ESCAU, ESCOC, ESDEN, ESSFR, ESGLN, ESGLS, ESGRB, ESGRG, ESIKG, ESKNW, ESLNW, ESLOA, ESMAI, ESMID, ESQUE, ESSHO, ESTNT, ESWHI, LCAIN, LCAPB, LCBAC, LCBAR, LCBIR, LCBRN, LCBUS, LCCLE, LCCOC, LCFRE, LCHBK, LCHEY, LCKEN, LCKHA, LCLON, LCLYT, LCMAR, LCPAD, LCPEN, LCPLB, LCPLE, LCTOD, LCWAL, LCWHI, LCWIL, LCWOR, LNBGN, LNCUF, LNPFT, LSBKM, LSCOB, LSFARN, LSGRNH, LSMERS, LSUWAR, LVBIL, LVCUL, LVEAS, LVFRO, LVHEL, LVHOY, LVNOR, LVRAI, LVUPH, LWRAD, MRARD, MRKNU, MRSAD, MYBNN, MYCAL, MYDUD, MYGOO, MYGUI, MYHAW, MYHON, MYILK, MYILL, MYKKB, MYKNA, MYMTH, MYRPN, MYSCA, MYSKE, MYSLA, MYSM, MYSNH, MYSOW, MYSTE, MYTHN, MYWEH, NDACO, NDAGR, NDAYL, NDBAR, NDBEA, NDBHI, NDCHE, NDCHS, NDCOP, NDHEA, NDHOO, NDHYT, NDON, NDMSH, NDNRO, NDPWO, NDSHE, NDSNO, NEBL, NEFH, NEFN, NEHHL, NEHZ, NEP, NEPH, NERE, NEWAS, NIAM, NIBB, NIBC, NIBRH, NIDLD, NIFWM, NILDW, NILE, NIMAL, NINY, NSASH, NSBLG, NSDEN, NSELG, NSELL, NSKGW, NSKNC, NSLNG, NSNTH, NSWES, SDHYLNG, SDLSLNT, SDPCHVN, SDPTRSF, SDSNDWN, SDSTBBN, SDSTHWC, SDSTHWT, SDSTYNN, SDTTCHF, SLARM, SLASC, SLBCC, SLBLR, SLBOI, SLBWD, SLCLS, SLCUD, SLCX, SLGL, SLGY, SLHBE, SLHLG, SLHTW, SLHYG, SLIMM, SLKIV, SLNCU, SLOB, SLPN, SLRY, SLSC, SLTHY, SLTKL, SLWKT, SLWM, SLWS, SLWTH, SMAP, SMBU, SMBWD, SMCAR, SMCG, SMFK, SMGM, SMHGN, SMKI, SMKO, SMKT, SMPEN, SMSTF, SMWE, SMWI, SSALM, SSBCL, SSCBD, SSCHN, SSHWK, SSKEY, SSSHE, SSTHO, SSWIB, SSWOB, STBISHW, STBLNFD, STBURSN, STDORCH, STHAMBL, STHICLF, STLYTMN, STSTHBN, STVERWD, SWADW, SWAG, SWAVY, SWBPG, SWCIT, SWCJW, SWCYX, SWDPW, SWEBY, SWFBX, SWGC, SWGLN, SWLLR, SWMMV, SWMYS, SWNE/CH, SWOAG, SWPDU, SWPEK, SWPND, SWRDA, SWRDX, SWRWI, SWSKU, SWTEZ, SWTFA, SWTR, SWXNH, SWYYN, SWZKS, THBW, THCK, THCN, THFC, THIP, THLG, THWP, THWR, WMMFD, WMTRE, WNBUC, WNCKO, WNDAW, WNFL, WNHAW, WNHR, WNHW, WNM, WNNP, WNPRS, WNRE, WNRWX, WNSY, WSANN, WSARD, WSAYR, WSBEI, WSBRE, WSBRW, WSBUS, WSCAB, WSCMN, WSDMS, WSGOU, WSGRE, WSHEL, WSIRS, WSIRV, WSKBN, WSKIE, WSKIW, WSLAR, WSLES, WSPOS, WSPRE, WSPRO, WSSTE, WSSTN, WSSTW, WSTRO, WWBRIX, WWCHRS, WWDRAWL, WWHAYL, WWILFR, WWNANP, WWPINH, WWSALT, WWSHIP, WWTEIG, WWTIVE

Annex 6

Updated geographic analysis

Introduction

- A6.1 We have analysed the data provided by communications providers (CPs) as a key part of the process when defining the geographic market boundaries. The analysis has been carried out taking account of the Common Practice for geographic market analysis defined by ERG⁵⁶. This Annex describes the approach and results of the geographic analysis that we have taken in the preparation of this consultation document.
- A6.2 KCOM is the only fixed network provider in the Hull area and, based on information provided by CPs, currently no other operator has plans to deploy a broadband network in that area. Accordingly, this geographic analysis is centred on the UK excluding the Hull area.
- A6.3 We have used data at two points to inform our geographic market definition: actual data from June 2010 and forecast data based on confirmed rollout plans by the Principal Operators (POs). Whilst not all POs indicated firm dates for completion of this rollout we have assumed this will be largely complete by December 2010. Therefore the data shown for December 2010 below corresponds to the firm rollout plans of each PO.
- A6.4 Some POs provided forecasts of rollout plans beyond this. Again, some of these plans were open ended. These plans are not confirmed. We have, therefore, not included them in our final geographic market definition. However, for completeness we have included them in this Annex to show the effect that they would have on the geographic market definition if they are implemented in full. We have indicated these within the data tables as “Uncommitted”.

Geographic unit

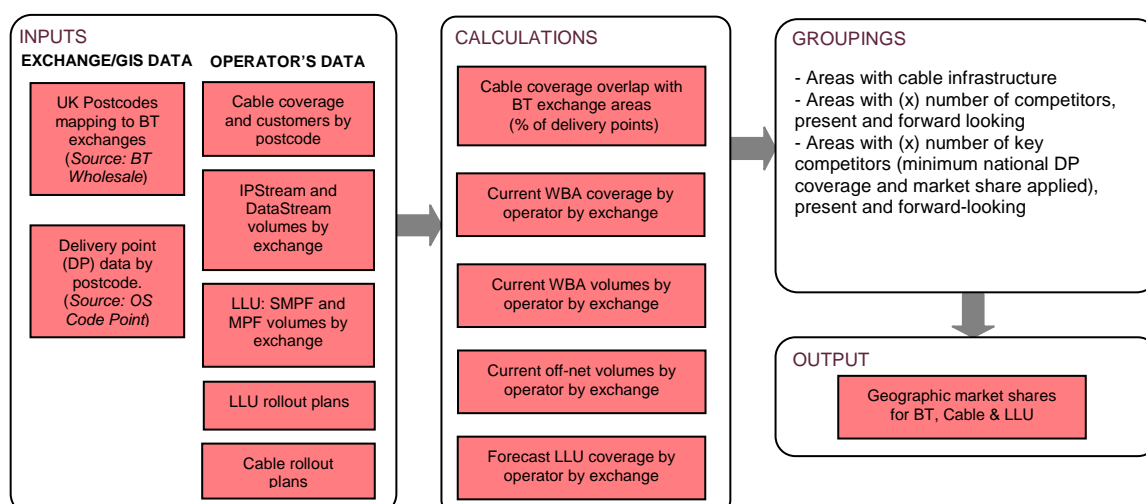
- A6.5 As described in Section 3 and in keeping with our previous review of this market in 2008, we are proposing to use local exchanges as the basic geographic unit in our assessment. There are 5,587 local exchanges in BT’s network and 14 in KCOM’s network.

Overview of the model structure

- A6.6 Figure A6.1 shows an overview of the model structure that we have used (inputs, procedures, and outputs) for assessing and defining the geographic markets.

⁵⁶ http://www.erg.eu.int/doc/publications/erg_08_20_final_cp_geog_aspects_081016.pdf

Figure A6.1: Model structure



Data provided by BT and Virgin Media

A6.7 The data provided by BT and Virgin Media is summarised in Table A6.1.

Table A6.1: Data provided by BT and Virgin Media

Operator	Wholesale product	Data provided
BT (Wholesale)	Broadband access services – asymmetric	<ul style="list-style-type: none"> • IPStream take-up: Working System Size (WSS) per customer by exchange • DataStream take-up: WSS per customer by exchange
BT (Openreach)	LLU inputs	<ul style="list-style-type: none"> • SMPF installed base (live circuits) per LLU operator by exchange • MPF installed base (live circuits) per LLU operator by exchange
Virgin Media	Broadband cable	<ul style="list-style-type: none"> • Broadband coverage by postcode • Broadband customers by postcode • Cable rollout plans (delivery points covered by postcode and implementation certainty)

Data provided by LLU operators

A6.8 In June 2010 we asked the Principal LLU Operators (C&W, O2, Sky and TTG) to identify which exchanges they had enabled and to provide their most recent forecast rollout plans - identifying exchanges which they intend to enable and the

date that they planned to be in a position to offer broadband services from these exchanges.

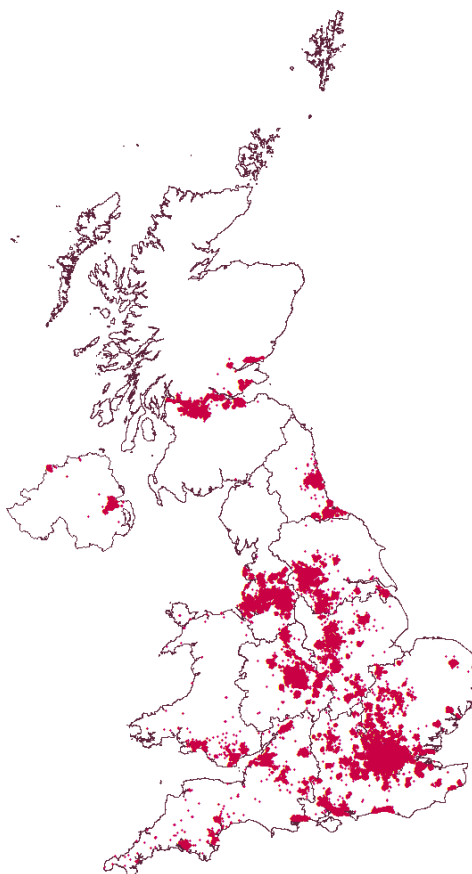
Exchange size calculations

- A6.9 The first step in our analysis was to map every delivery point (DP) in the UK, as provided in the Ordnance Survey data, to the local exchange that serves it. This allows us to estimate the size of each local exchange, in terms of the total number of residential and business delivery points that it serves.
- A6.10 This step was performed by combining the Ordnance Survey delivery point data for UK postcodes with BT's (and KCOM's in the Hull area) data that maps UK postcodes to each exchange. Due to inconsistencies in the postcode lists between these two data sources, this process results in a small amount of data loss. However, overall, 99.4 per cent of the exchange postcodes were matched successfully and the median postcode loss per exchange was 0.8 per cent. The small amount of data loss resulting from this process was compensated for by uplifting the delivery points by a factor determined by the number of postcodes 'dropped' on an exchange-by-exchange basis.

Cable overlap calculations

- A6.11 Virgin Media provided data on its broadband cable coverage by specifying the number of delivery points it can presently offer service to for each postcode. Our methodology maps this directly to the delivery point data for the UK postcodes. Figure A6.2 shows the data provided by Virgin Media at the end of June 2010.
- A6.12 In addition, as part of our forward looking approach, we have included Virgin Media's most recent confirmed rollout plans in our geographic market analysis.

Figure A6.2: Virgin Media's broadband cable network coverage



A6.13 As the basic geographic unit for our geographic market analysis is BT's local exchanges, we mapped Virgin Media's coverage information by postcode onto BT's local exchanges.

A6.14 The cable network is, however, independent of BT's local exchanges and thus the two do not necessarily align. The overlap between the two networks in a local exchange area may vary from nothing (0 per cent overlap) to complete overlap (100 per cent overlap). Figure A6.3 shows how Virgin Media's cable network overlaps with BT's local exchanges to differing degrees. As set out in the first consultation and also discussed in section 3, we are proposing to consider Virgin Media as being present within a local exchange when the overlap is at least 65 per cent. Figure A6.4 shows the local exchanges where Virgin Media's overlap is at least 65 per cent.

Figure A6.3: Cable overlap with BT exchanges

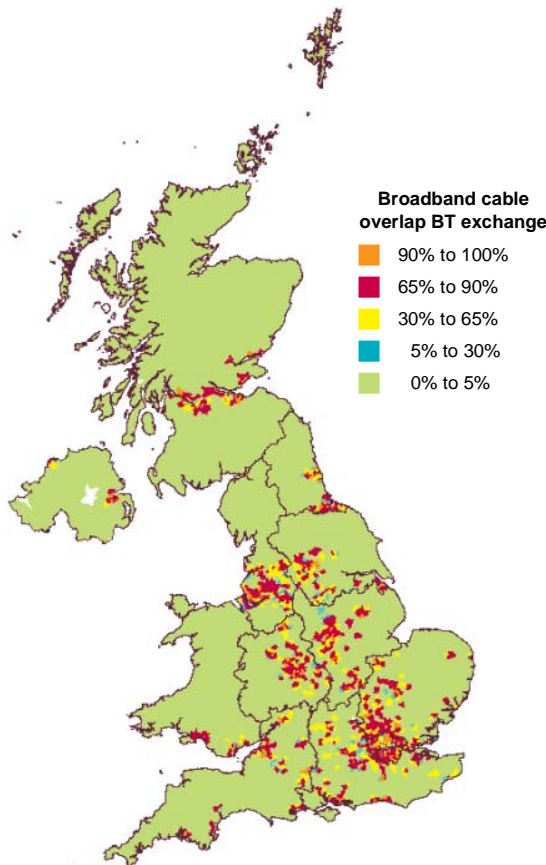
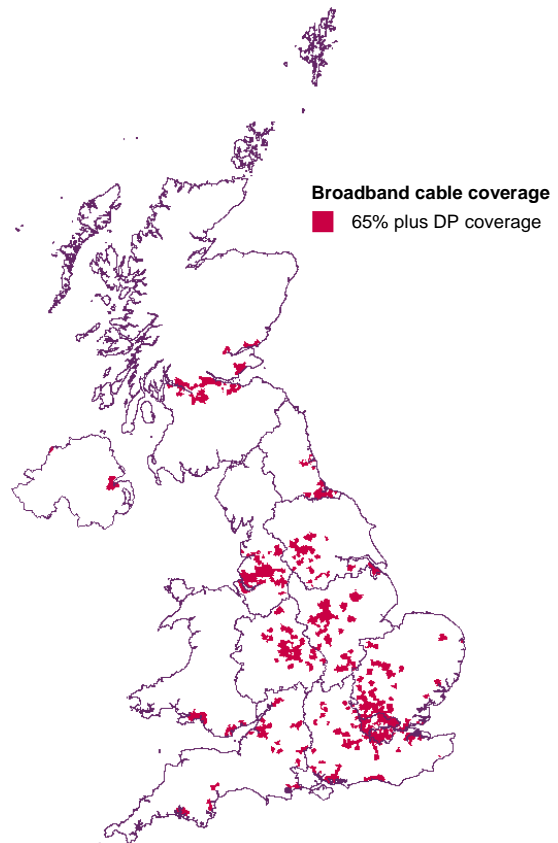


Figure A6.4: Exchanges where cable overlap is at least 65%



A6.15 At the end of June 2010 there were 829 local exchanges where Virgin Media's overlap is at least 65 per cent. These 829 exchanges serve 44.8 per cent of UK delivery points. However, when we include Virgin Media's most recent confirmed rollout plans the number of local exchanges where Virgin Media's overlap is at least 65 per cent increases to 837 (45.5 per cent of UK delivery points).

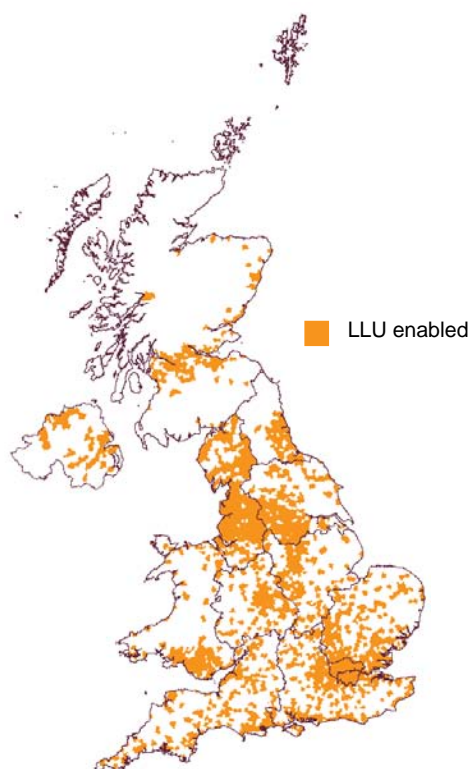
A6.16 Virgin Media provided further rollout plans and based on these plans the number of local exchanges where its overlap is at least 65 per cent will increase to 849 (46.1 per cent of UK delivery points). However, these rollout plans are not confirmed.

LLU coverage

A6.17 Analysis of the June 2010 LLU data indicates that there are 25 active (non-BT) LLU operators.

A6.18 Specifically, 2,145 BT exchanges (85.8 per cent of UK delivery points) are enabled by at least one LLU operator, and the maximum number of LLU operators active in any one exchange is 7. Figure A6.5 shows the location of these exchange areas.

Figure A6.5: LLU enabled exchange areas, as of June 2010⁵⁷



A6.19 As outlined in Table A6.2, the coverage of individual LLU operators varies with many operators focusing on narrow areas representing less than 10 per cent coverage of UK delivery points. There are currently five LLU operators with more than 10 per cent coverage, while four LLU operators have coverage ranging between 50 per cent and 90 per cent. It is these four LLU operators that we consider to be “Principal LLU Operators” and these are C&W, O2, Sky and TTG. The LLU operator that has between 10 per cent and 20 per cent coverage is Uptdata Infrastructure.

Table A6.2: Breakdown of the coverage of LLU operators⁵⁸

Coverage	Jun-10	Dec-10	Uncommitted
Up to 10%	20	20	20
Over 10%	5	5	5
Over 20%	4	4	4
Over 30%	4	4	4
Over 40%	4	4	4
Over 50%	4	4	4
Over 60%	3	3	4
Over 70%	1	2	2
Over 80%	1	2	2
Over 90%	0	0	0

⁵⁷ This figure shows all the 25 active LLU operators.

⁵⁸ The December 2010 and uncommitted rollout figures only include forecast rollout plans from the four Principal LLU Operators.

The Principal LLU operators

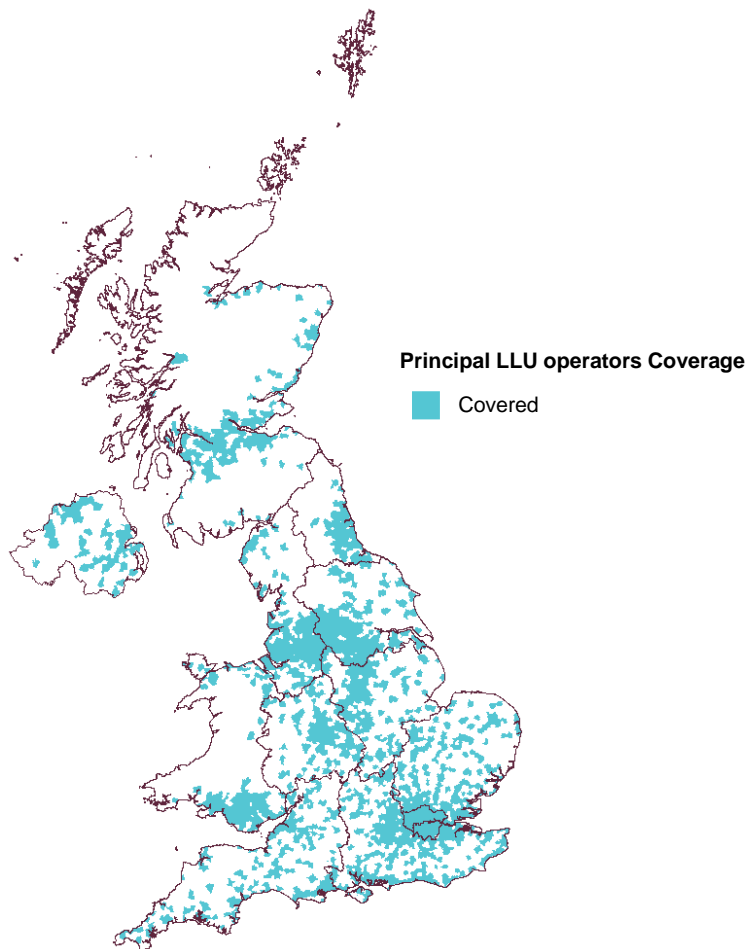
- A6.20 When defining the geographic market boundaries we propose to only use the coverage of the Principal LLU Operators.
- A6.21 Table A6.3 outlines the combined coverage of the Principal LLU Operators for June 2010 and shows how this is expected to change as a result of confirmed (December 2010) and the additional, uncommitted potential rollout plans.

Table A6.3: Current and forecast coverage for the Principal LLU operators

	Jun-10	Dec-10	Uncommitted
Coverage	84.1%	87.1%	87.9%
No. exchanges	1,922	2,140	2,208

- A6.22 Figure A6.6 shows the 2,140 exchanges where the Principal LLU Operators are forecast to be present at the end of December 2010.

Figure A6.6: Exchanges where the Principal LLU Operators are forecast to be present at the end of December 2010



The Principal Operators

- A6.23 If BT and Virgin Media are added to the Principal LLU Operators then there is a total of six Principal Operators (POs) upon which our geographic market boundaries are defined.
- A6.24 Table A6.4 provides a breakdown of the number of exchanges (and the percentage of UK delivery points) by the number of the POs within each exchange. This table shows the actual situation as of June 2010 and how this is expected to change as a result of forecast rollout plans.

Table A6.4: Exchange breakdown by number of POs present

No. POs	Jun-10		Dec-10		Uncommitted	
	No. Exchs	Coverage	No. Exchs	Coverage	No. Exchs	Coverage
BT only	3,586	14.3%	3,388	11.7%	3,332	11.0%
2	546	9.5%	407	5.3%	293	3.2%
3	284	8.6%	449	9.7%	524	9.5%
4	309	11.9%	382	14.1%	391	13.3%
5	396	22.8%	460	24.4%	519	26.6%
6	466	32.3%	501	34.1%	528	35.7%

Service share calculations

- A6.25 In this consultation we are proposing to use service shares at the exchange level, in addition to the number of POs present, when defining the geographic boundaries. In particular we are proposing to use BT service shares in situations where three POs are present (or forecast to be present) as a way of identifying the more competitive exchanges within this group. The service share threshold we propose to use is 50 per cent.
- A6.26 It is forecast that by the end of December 2010 there will be 449 exchanges where three POs are present. If we assess BT's service share in these exchanges, using actual data as of June 2010, we find that BT's share is less than 50 per cent in 103 of these exchanges.
- A6.27 However, given that we are allowing for forecast future rollout in this assessment we need to also allow for any expected future changes in service shares. In particular, LLU operators will often build up a customer base using BT's wholesale products and then when they unbundle an exchange will migrate these customers onto their LLU based network. Using the BT Wholesale data we are able to identify the number of customers that LLU operators have, based on BT's wholesale products, in exchanges that they have, or plan to, unbundle. We believe that it is reasonable to assume that these customers will be migrated and we can adjust the future service shares accordingly.
- A6.28 If we allow for customer migration then, of the 449 exchanges where three POs are present, BT's service share will be less than 50 per cent in 196 of these exchanges, Table A6.5 summarise these breakdowns and shows the coverage of the different groups.

Table A6.5: Exchanges where 3 POs are present broken down according to BT's service share with and without customer migration

	Before customer migration		After customer migration	
	No. Exchs	Coverage	No. Exchs	Coverage
BT market share \geq 50%	346	6.7%	253	4.8%
BT market share < 50%	103	3.0%	196	4.9%

Grouping exchanges

A6.29 As discussed in section 3, we are proposing to define three geographic markets by grouping BT's local exchanges based on the following criteria:

- Market 1: exchanges where only BT is present;
- Market 2: exchanges where 2 POs are present or forecast and exchanges where 3 POs are present or forecast but where BT's share is greater than or equal to 50%; and
- Market 3: exchanges where 4 or more POs are present or forecast and exchanges where 3 POs are present or forecast but where BT's share is less than 50%.

A6.30 The size of each of these markets, both number of local exchanges and coverage, based on actual data as of June 2010 and forecast data to December 2010 and the additional uncommitted potential rollout, is shown in Table A6.6.

Table A6.6: Market sizes based on actual and forecast data

Market	Jun 10		Dec 10		Uncommitted	
	No. Exchs	Coverage	No. Exchs	Coverage	No. Exchs	Coverage
Market 1	3,586	14.3%	3,388	11.7%	3,332	11.0%
Market 2	640	12.0%	660	10.0%	631	8.6%
Market 3	1361	73.0%	1539	77.6%	1624	79.7%

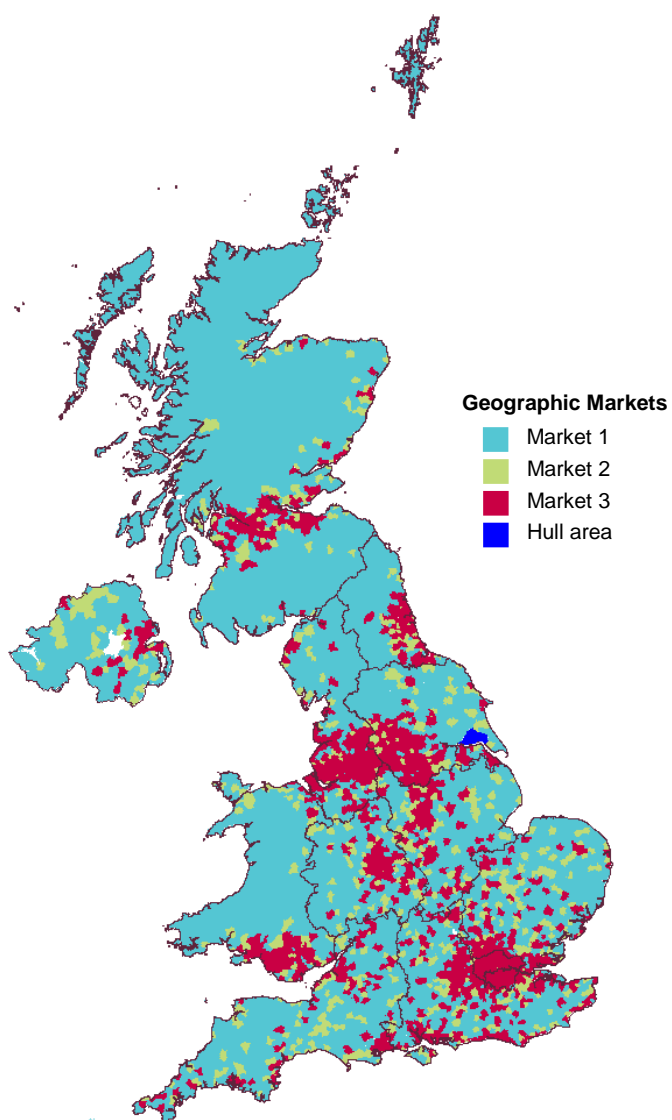
Proposed geographic markets

A6.31 Although operators have provided forecast rollout plans beyond December 2010, these plans are not committed. We therefore considered that it would be inappropriate to use these when defining the geographic markets. We, therefore, consider it appropriate to use the committed forecast rollout plans to the end of December 2010. Based on this we identify the geographic markets as shown in Table A6.7.

Table A6.7: Proposed geographic market definition

Market	No. Exchs	Coverage
The Hull area	14	0.7%
Market 1	3,388	11.7%
Market 2	660	10.0%
Market 3	1,539	77.6%

Figure A6.7: Proposed geographic markets on a map



Sensitivity analysis

A6.32 In order to identify the geographic markets it has been necessary for us to make a number of judgements in identifying clear and unambiguous criteria for delineating the proposed market boundaries. In particular, we have investigated the stability of the market sizes for small variations around the amount of cable overlap and BT market share thresholds proposed and the effect of considering customer migration. The tables below show how sensitive the geographic market definition is to changes in these parameters.

Table A6.8: Sensitivity to changes in the cable overlap threshold in an exchange

	Overlap > 55%		Overlap > 65%		Overlap > 75%		Overlap > 85%	
	No. Exchs	Coverage	No. Exchs	Coverage	No. Exchs	Coverage	No. Exchs	Coverage
Market 1	3,371	11.5%	3,388	11.7%	3,412	11.9%	3,433	12.1%
Market 2	665	10.0%	660	10.0%	651	10.1%	640	10.1%
Market 3	1,551	77.8%	1,539	77.6%	1,524	77.3%	1,514	77.1%

A6.33 Change in the minimum cable overlap value has an effect on all the three markets. Particularly, a lower overlap threshold will shift more exchanges from Market 1 to Market 2 and Market 3, and vice versa. Between minimum overlap values of 55 per cent and 85 per cent, the largest variation in the size of any one market is about 0.7 per cent.

A6.34 When we further reduce the overlap threshold from 55 per cent to 50 per cent, Market 1 reduces in size by 15 exchanges which cover 0.2 per cent of UK delivery points and Market 2 increase in size by the same 15 exchanges. There is, however, no change at all to Market 3.

Table A6.9: Sensitivity to changes in BT's service share threshold in exchanges with 3 POs and with and without customer migration

	Without migration				With migration			
	BT share < 40%		BT share < 50%		BT share < 40%		BT share < 50%	
	No. Exchs	Coverage	No. Exchs	Coverage	No. Exchs	Coverage	No. Exchs	Coverage
Market 1	3,388	11.7%	3,388	11.7%	3,388	11.7%	3,388	11.7%
Market 2	812	13.7%	753	12.0%	781	13.0%	660	10.0%
Market 3	1,387	73.9%	1,446	75.6%	1,418	74.6%	1,539	77.6%

A6.35 Changing the threshold for BT's service share and whether customer migrations are taken into account or not, in exchanges where three POs are present, only affect Market 2 and Market 3. Table A6.9 shows that changing the service share threshold from 50 per cent to 40 per cent results in approximately a 3 per cent change in the size of the markets. Using the 50 per cent service share threshold, the affect of customer migration is 1.9 per cent on the size of the markets.

Comparison between current (May 2008) and proposed market definitions

A6.36 Table A6.10 shows the current (May 2008) and proposed geographic market definitions.

Table A6.10: Comparison between current (May 2008) and proposed market definitions

	Current (May 2008) markets		Proposed markets	
	No. Exchs	Coverage ⁵⁹	No. Exchs	Coverage
Market 1	3,720	16.8%	3,388	11.7%
Market 2	670	13.7%	660	10.0%
Market 3	1,197	68.7%	1,539	77.6%

A6.37 Table A6.11 shows how these changes materialise at the exchange level. Overall, a total of 4,900 exchanges remain in the same markets, covering 85.2 per cent of UK delivery points.

A6.38 Table A6.11: Variation of market definition at the exchange level

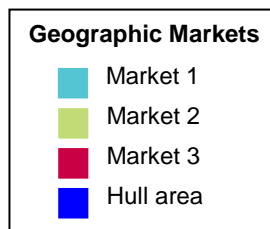
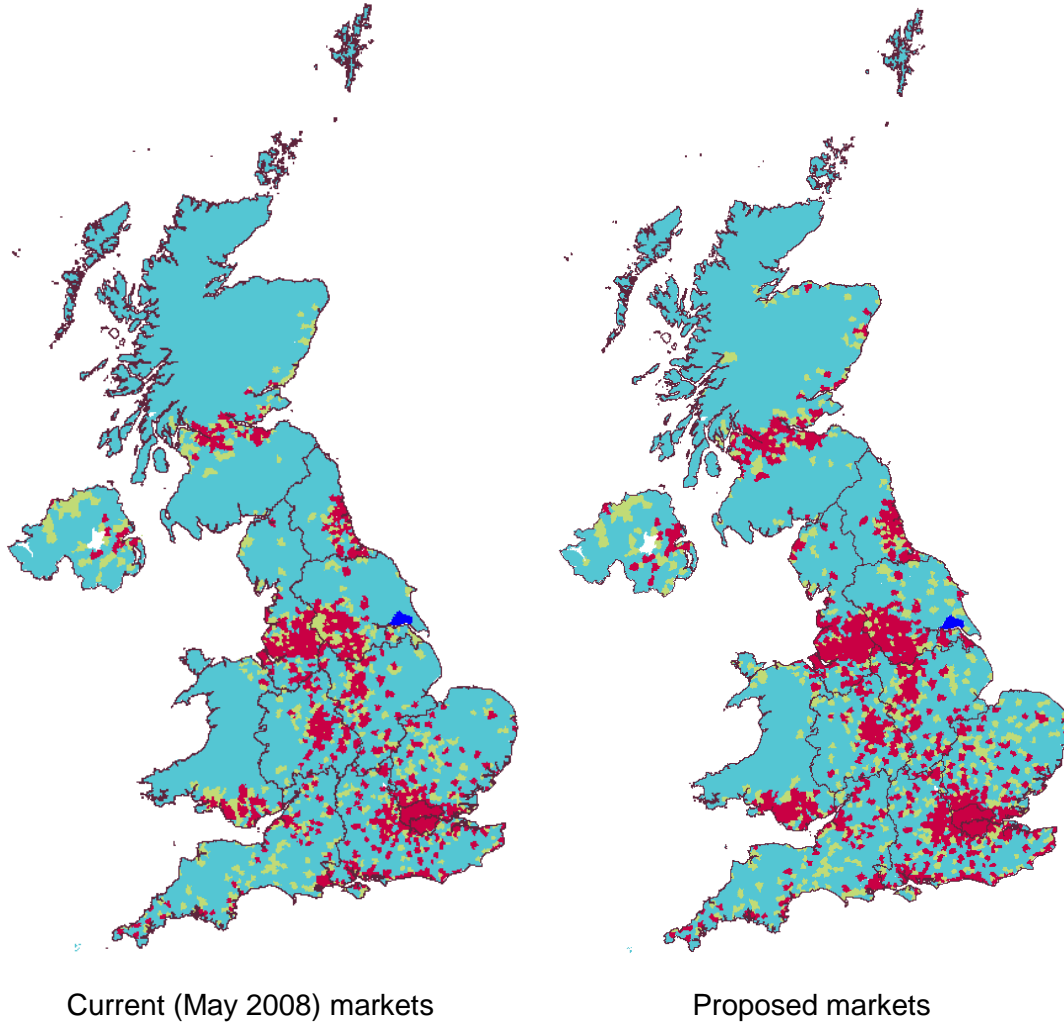
	No. Exchs	Coverage
No change in market	4,900	85.2%
Market 1 unchanged	3,383	11.6%
Market 2 unchanged	327	5.0%
Market 3 unchanged	1,190	68.5%
Market 1 to Market 2	326	4.8%
Market 1 to Market 3	11	0.4%
Market 2 to Market 1	5	0.0%
Market 2 to Market 3	338	8.6%
Market 3 to Market 1	-	0.0%
Market 3 to Market 2	7	0.2%
Total	5,587	99.3%

A6.39 The few cases where exchanges have moved to a less competitive market (from Market 2 to Market 1 or from Market 3 to Market 2) are explained by two main factors. Firstly, there are exchanges where Virgin Media marginally exceeded the 65 per cent overlap threshold in the previous market review, but does not exceed it any more. These changes are due to Virgin Media improving its information on its network coverage and small changes in the Ordnance Survey delivery point data for UK postcodes. Secondly, consolidation in the broadband market has resulted in a reduction in the number of POs present. In particular, the acquisition of Tiscali by TTG in 2009 and the recent agreement between BT and Orange.

⁵⁹ Any variation from information presented in the 2008 WBA review are due to updates in the underlying OS data we have used to plot the markets.

A6.40 Figure A6.8 makes a visual comparison between the current (May 2008) and the proposed market definitions.

Figure A6.8: Comparison between current (May 2008) and proposed market definitions



Annex 7

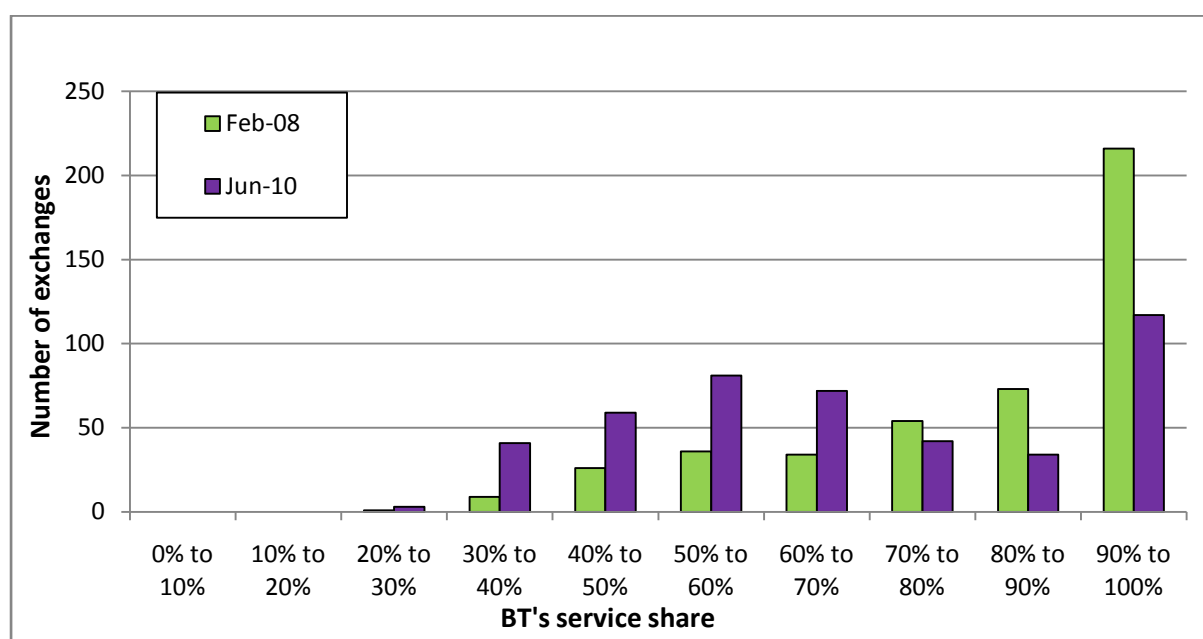
Distribution and evolution of service shares

A7.1 In this Annex we present data on BT's service share at the exchange level. In particular we show the distribution of BT's service share within the defined geographic markets and how it has evolved over time.

Service share distribution and evolution in exchanges where three POs are present

A7.2 As set out in this consultation we are proposing to introduce an exchange level service share criterion, for exchanges where three POs are present or forecast, when defining the geographic markets. There are 449 exchanges where three POs are present or forecast and Figure A7.1 shows the distribution of BT's service share within these 449 exchanges and how it has evolved over time.

Figure A7.1: Distribution of BT's service share in the 449 exchanges where three POs are present or forecast



A7.3 As can be seen from Figure A7.1, competition in the 449 exchanges where three POs are present has resulted in a sizable shift in the distribution of BT's service share between February 2008 and June 2010, with BT's service share being below 50 per cent in 103 exchanges

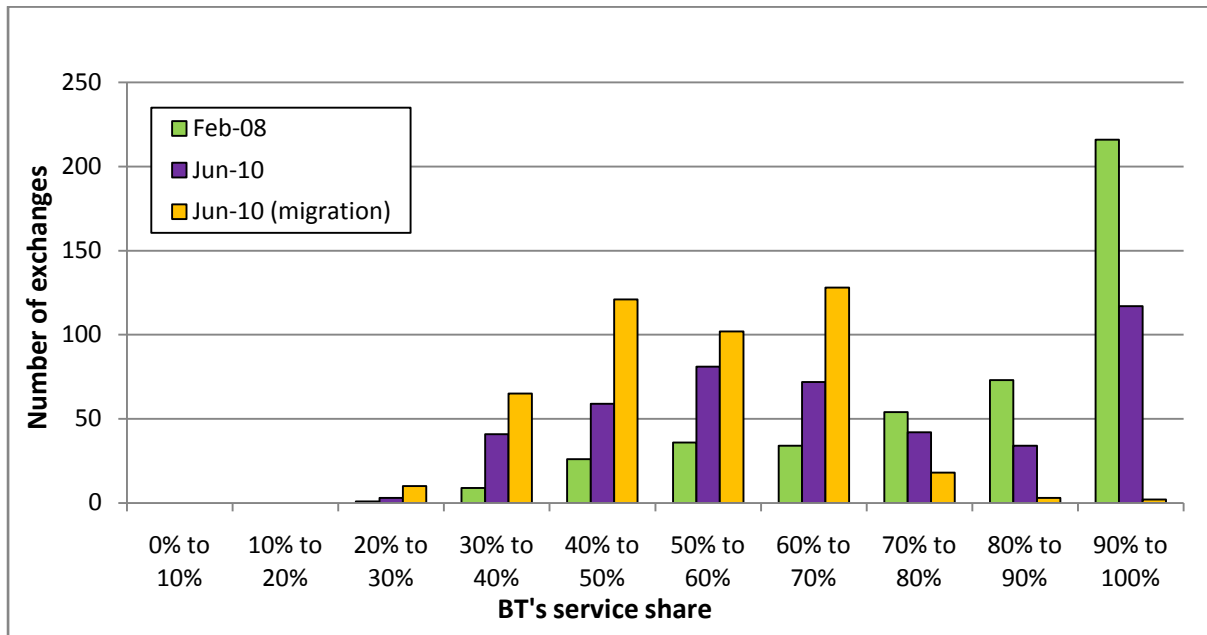
A7.4 However, Figure A7.1 above shows that there are also 117 exchanges where BT's market share exceeds 90 per cent. This is due to forecast rollout in exchanges where BT is currently the only provider or due to recent deployments where the effects of new entry are not yet demonstrated.

A7.5 As described in section 3, we are proposing to use BT's service share at the exchange level in exchanges where three POs are present as of June 2010, or

forecast to be present by December 2010. To further take account of expected future changes in service shares, we propose to adjust the service shares of LLU POs that are present in these exchanges to account for the potential for these POs to migrate their customer base from BT's wholesale products to their own LLU based network.

A7.6 Figure A7.2 below shows how current (June 2010) BT market share is affected following customer migration in the 449 exchanges where 3 POs are present or forecast to be present by December 2010.

Figure A7.2 Distribution of BT's service share in the 449 exchanges where three POs are present or forecast including migration



A7.7 The inclusion of customer migration affects primarily exchanges where BT currently holds large market share as these are exchanges where currently two or one (BT only) POs are present. The LLU POs that plan to unbundle these exchanges already have a customer base using BT's wholesale products that could be migrated on their own LLU based network when the forecast deployment is implemented.

A7.8 In this consultation we are proposing to include BT's service share as an additional criteria in exchanges where three POs are present. We are proposing that where three POs are present and BT's service share (after migration is taken into account) is equal to or more than 50 per cent the exchange should be allocated to Market 2. Where three POs are present and BT's market share after migration is below 50 per cent, we propose that these exchanges should be allocated to Market 3. Figures A7.3 and A7.4 show how BT service shares in these exchanges has evolved since February 2008 and the effect of migration, for exchanges that we propose to be in Market 2 and Market 3, respectively.

Figure A7.3 BT's share evolution in 253 exchanges where three POs are present or forecast to be present by December 2010 and that are proposed to be included in Market 2

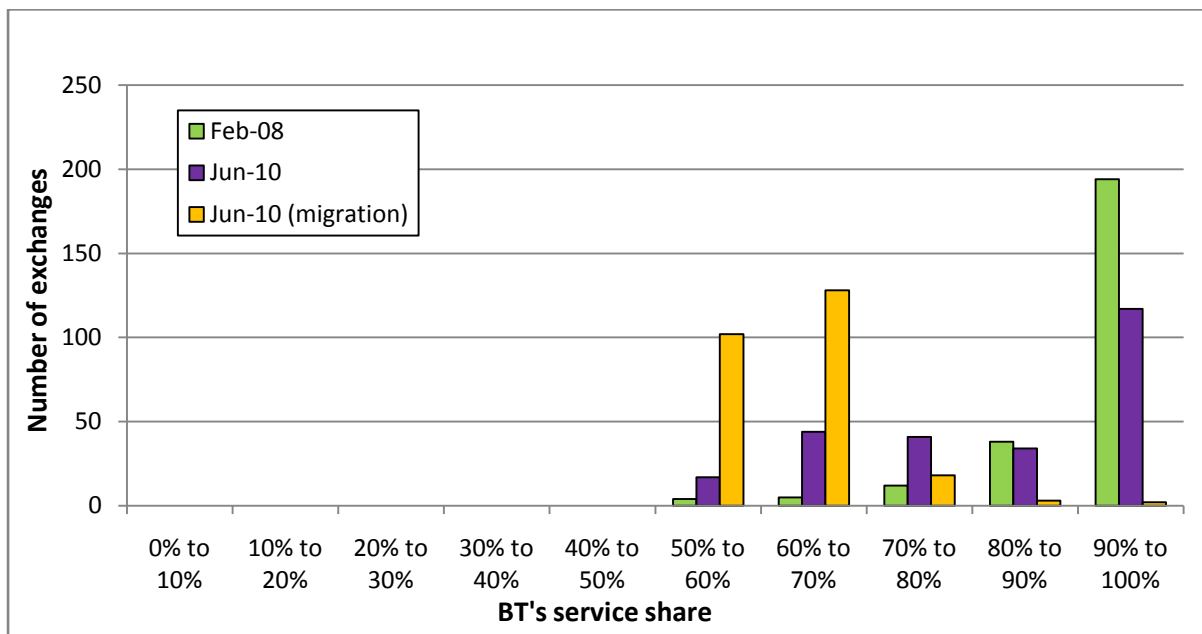
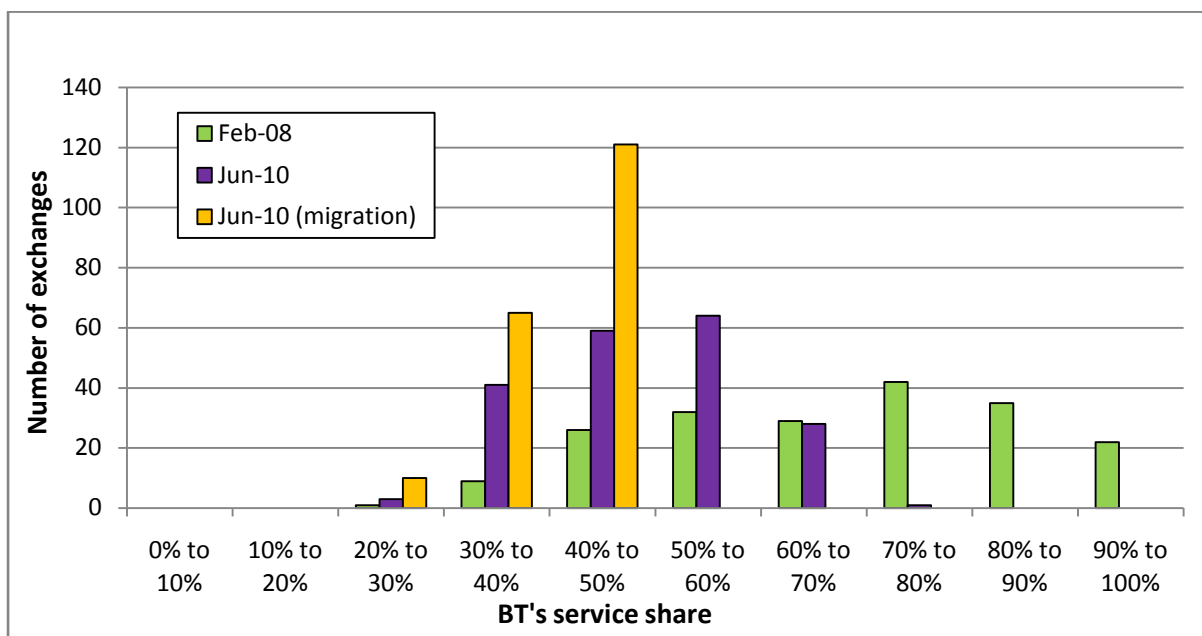


Figure A7.4 BT's share evolution in 196 exchanges where three POs are present or forecast to be present by December 2010 that are proposed to be included in Market 3

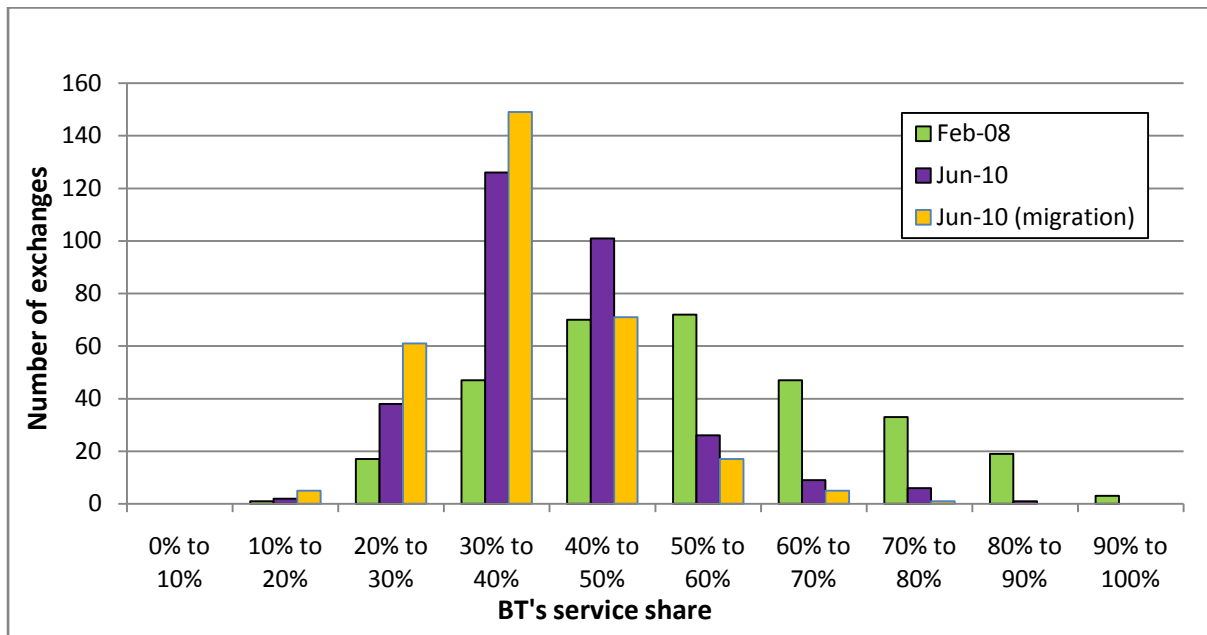


A7.9 Comparing Figures A7.3 and A7.4 above we see that all but one exchange where three POs are present and BT's service share is over 70 per cent (pre-migration) remain in Market 2. Exchanges where BT has pre-migration share between 50 per cent and 70 per cent are split between the two markets with Market 3 attracting those where a new LLU entrant has already significant service shares through a BT wholesale product.

Service share distribution and evolution in exchanges where four POs are present

A7.10 We are not proposing to set a market share criterion in exchanges where four POs are present or forecast to be present. There are 309 exchanges where four POs are present in June 2010. Figure A7.5 shows the BT service share evolution since February 2008 in these exchanges. It shows that a clear reduction in the number of exchanges where BT has a high share. At present there are only 42 (out of the 309) exchanges where BT has a share above 50 per cent and if forecast entry and migration are accounted for this figure drops to 23.

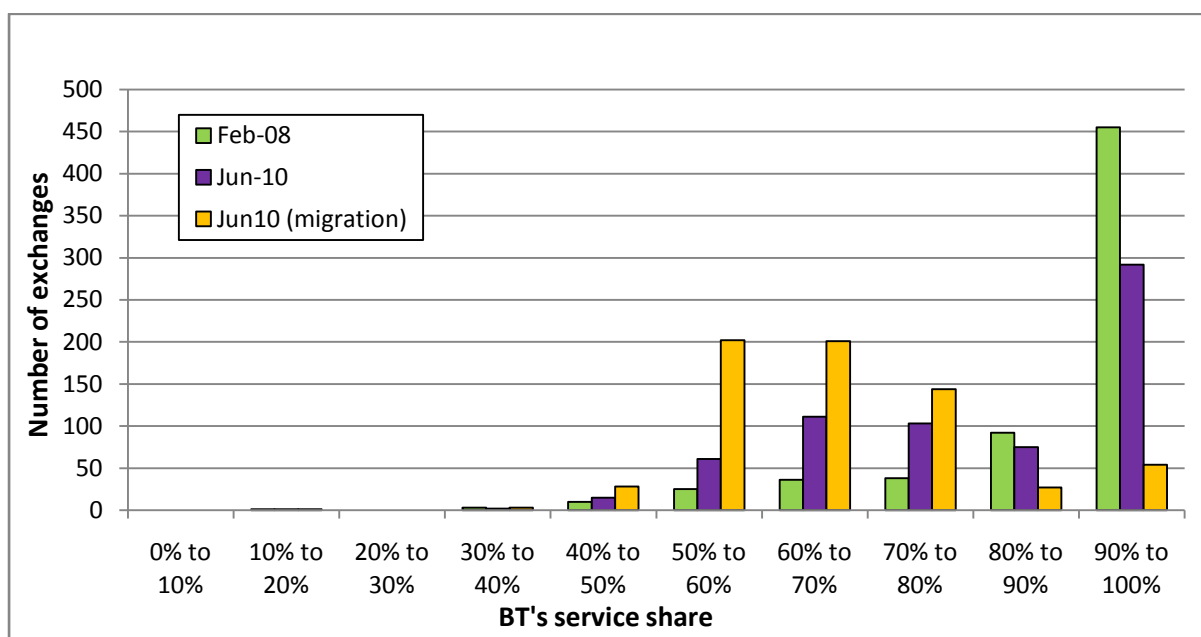
Figure A7.5 Evolution of BT's market share evolution in 309 exchanges where four POs were present in June 2010, including the effect from customer migration



Service share distribution and evolution in Market 2

A7.11 In this consultation we have proposed to include 660 exchanges in Market 2. Figure A7.6 shows the distribution of BT's service share within these 660 exchanges and how it has evolved over time (including the effects of migration).

Figure A7.6: Distribution of BT's service share in Market 2

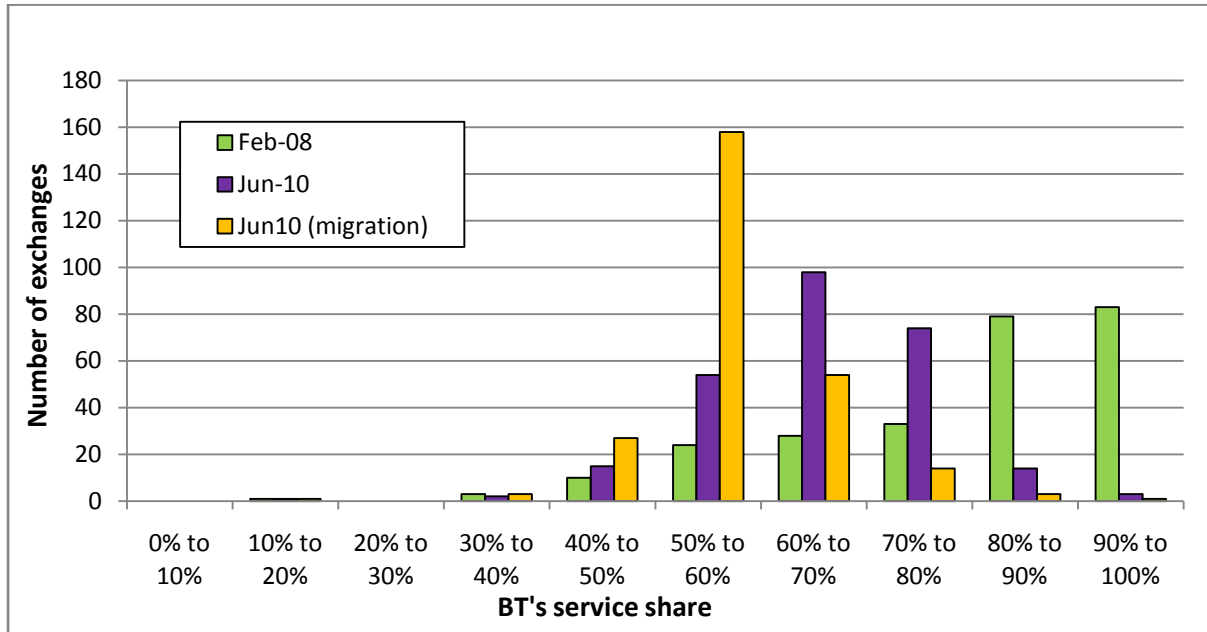


A7.12 This shows that there are a large number of exchanges (292) where BT's service share is over 90 per cent as per June 2010. Although there are a small number of cases where BT's share has stayed high even though entry occurred some time ago (five exchanges), this is mainly a result of the forward looking assessment, which has led us to include exchanges in Market 2 based on the forecast rollout plans of POs. This means that at the current time BT is the only operator present in 182 of these exchanges. In addition, 105 of these exchanges have been unbundled only recently. Accordingly, in these exchanges, BT will have a service share of (or close to) 100 per cent. However, we believe that, following entry by other POs, BT's service share will reduce in these exchanges and will develop in a similar manner to those exchanges in Market 2 where entry occurred in the past.

A7.13 Figure A7.6 shows the effect of customer migration. This primarily affects market shares in exchanges where BT is currently the only service provider. The effect is smaller in exchanges where two or three POs have been present for some time as the number of off-net customers is likely to be small.

A7.14 Of the 660 exchanges in Market 2, 261 had two or three POs present in February 2008. The evolution of BT's shares in these 261 exchanges is shown in Figure A7.7.

Figure A7.7: Distribution of BT’s service share in the 261 exchanges in Market 2 in which two or three POs were present in February 2008

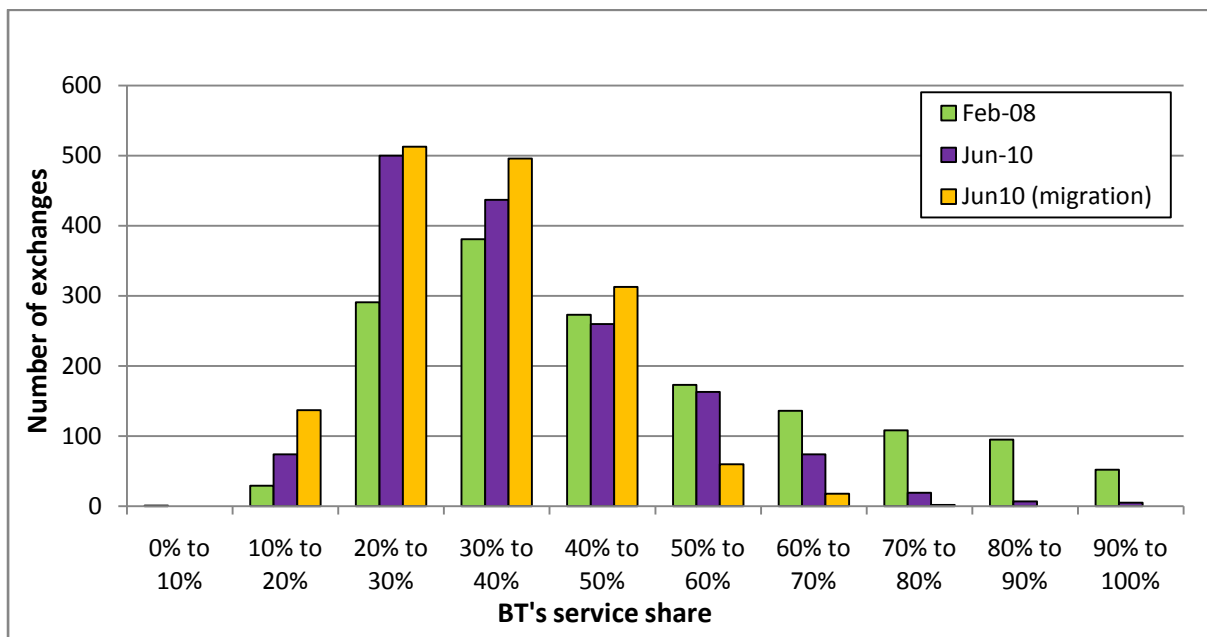


A7.15 Figure A7.7 shows clear reductions in BT’s share over time. In particular, there is a significant reduction in the number of exchanges where BT’s share is over 80 per cent. The other key feature shown in Figure A7.7 is that in the vast majority (243 out of 261) of these exchanges, BT’s share remains above 50 per cent. Even when migration is taken into account, BT’s share remains over 50 per cent in 230 exchanges.

Service share distribution and evolution in Market 3 exchanges

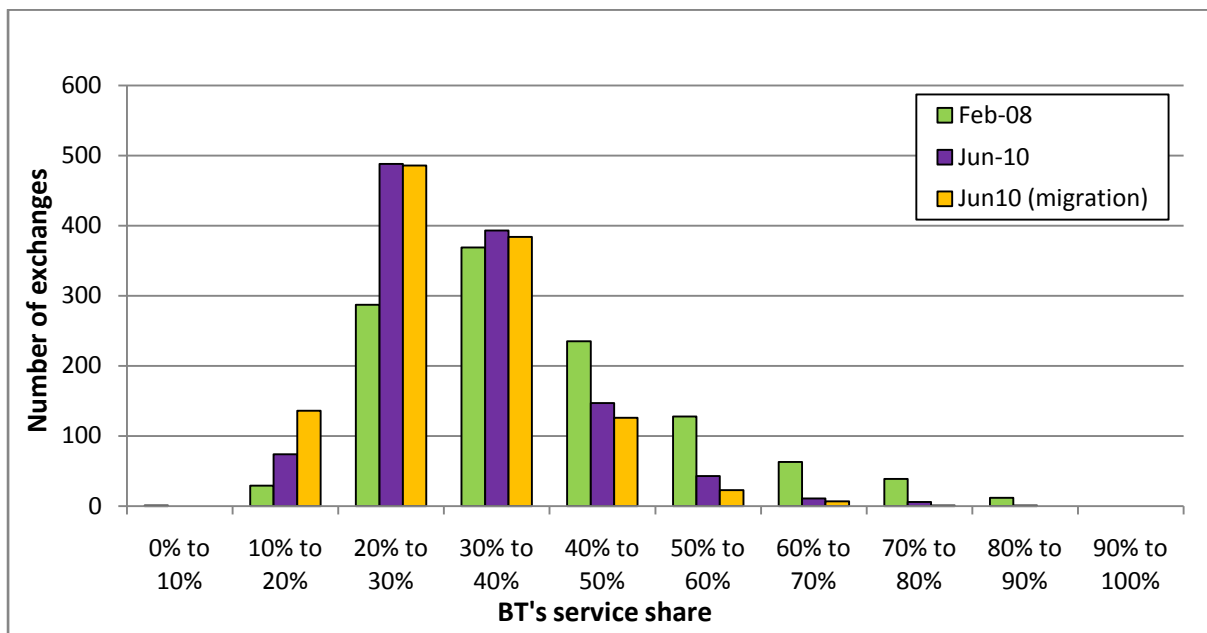
A7.16 In this consultation we have proposed to include 1,539 exchanges in Market 3. Figure A7.8 shows the distribution of BT’s service share within these 1,539 exchanges and how it has evolved over time.

Figure A7.8: Distribution of BT's service share in Market 3



A7.17 Of the 1,539 exchanges in Market 3, 1,163 exchanges had four or more POs present in February 2008. The evolution of BT's shares in these 1,163 exchanges is shown in Figure A7.9.

Figure A7.9: Distribution of BT's service share in the 1,163 exchanges in Market 3 in which four or more POs were present in February 2008



A7.18 Excluding the effects of migration, this shows that in the majority of these exchanges, BT's share is less than 40 per cent (955 exchanges) and there are few exchanges (61 exchanges) where BT's share is over 50 per cent. When migration is also accounted for, there are only 31 exchanges where BT's share is over 50 per cent.

A7.19 Comparison between Figures A7.8 and A7.9 shows that the increase in exchanges in Market 3 does not materially affect the overall market share distribution. The cases where BT has a higher share in Figure A7.8 are due to the forecasted or very recent deployment in these exchanges or are exchanges where three POs are present but BT's share is below 50 per cent, as per our proposed market definition in section 3. As set out in section 3 we consider that in these exchanges BT's share will continue to fall to be more in line with the shares seen in Figure A7.9.