Competition Act 1998
Decision of the Office of Communications
Investigation into BT’s residential broadband pricing
CW/00613/04/03

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Decision

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Section 1

Summary

Introduction

1.1 Ofcom has conducted an investigation to determine whether BT Group plc (“BT”) infringed the prohibition imposed under section 18 of the Competition Act 1998 (the Chapter II Prohibition) and/or Article 102 of the Treaty on the Function of the European Union (“TFEU”). Ofcom’s investigation has focussed on whether the pricing policies employed by BT when providing residential broadband services during the period from June 2002 to December 2004 amount to a margin squeeze prohibited by the Chapter II Prohibition and Article 102 TFEU.

1.2 The Chapter II Prohibition provides that any conduct on the part of one or more undertakings which amounts to the abuse of a dominant position in a market within the UK is prohibited if it may affect trade within the UK.

1.3 Article 102 TFEU prohibits the abuse of a dominant position if it affects trade between Member States.

1.4 Following a detailed analysis of BT’s financial performance and business plans during the period of investigation, Ofcom has concluded that the evidence is insufficient to support a finding of infringement in this case.

Ofcom’s investigation

1.5 Ofcom’s predecessor, the Director General of Telecommunications (“the Director”) initially conducted an investigation into BT’s pricing practices in the period to June 2002 and found that BT had not abused a dominant position during that period. That decision was the subject of an appeal to the Competition Appeal Tribunal (“CAT”) by the complainant which was upheld and the Director undertook to reconsider the issue. The Director then took a further decision in relation to BT’s conduct in the period up to June 2002 (“the Director’s Decision”) that BT was not operating a margin squeeze. The Director set out in that Decision the basis on which he considered a forward-looking net present value (“NPV”) analysis should be applied in considering whether there had been a margin squeeze.¹

1.6 At the same time as reconsidering this original decision into BT’s pricing in the period up to June 2002, the Director also decided to investigate BT’s residential pricing for a subsequent period. Ofcom assumed the functions of the Director in respect of the investigation following its creation in 2003. The investigation covers BT’s conduct in the period from 1 June 2002 (being the start of the period immediately following that considered in the Director’s Decision) to 31 December 2004 (being the date of the last set of management accounts obtained by Ofcom from BT in the context of the investigation). 1 June 2002 to 31 December 2004 is described in this Decision as the “period of investigation”.

1.7 Ofcom considers that a margin squeeze may be found to arise where, on the balance of probabilities, there is strong and compelling evidence to show that an undertaking active on vertically related markets and enjoying a position of dominance in the

¹ An appeal by Freeserve against the Director’s Decision has been adjourned pending Ofcom’s decision in the current investigation, which continued.
upstream market does not allow a sufficient margin between its upstream and downstream prices to enable its own downstream operations (or those of an equally efficient operator) to operate profitably.

1.8 Ofcom finds that BT enjoyed a dominant position in an upstream market for residential wholesale intermediate broadband services. Therefore, BT owed a special responsibility not to allow its conduct to distort competitive conditions in that market or in neighbouring markets, in accordance with the relevant case-law.\(^2\)

1.9 Ofcom’s approach to assessing whether BT abused its dominant position by allowing an insufficient margin for its downstream operations to trade profitably is set out in Section 4. Ofcom has assessed BT’s financial performance and pricing policies by means of two analyses, one based on historical accounting data, and the other on a series of NPV calculations, adjusted to include reasonable assumptions.

1.10 Ofcom’s provisional finding was that BT had infringed Article 102 TFEU and the Chapter II Prohibition on the basis that both methods of analysis produced negative results. Ofcom therefore issued statements of objections (“SOs”) to BT setting out its provisional findings. However, BT has since made detailed submissions in response to Ofcom’s financial assessment. Those submissions included both new financial information not previously provided to Ofcom; and new arguments about the appropriateness of the method used by Ofcom in its financial analysis.

1.11 In light of BT’s submissions, Ofcom has adjusted its NPV calculations in various regards. As a result of those adjustments and as set out below, Ofcom has concluded that the evidence is insufficient to support a finding that BT abused a dominant position during the period investigated.

**Market definition and dominance**

1.12 Ofcom has defined the product markets as follows:

1.12.1 At the upstream level, the market for residential wholesale intermediate broadband services in the UK (“the upstream market”)\(^3\); and

1.12.2 At the downstream level, the market for retail asymmetric residential broadband internet access services in the UK (“the downstream market”).

1.13 BT is a vertically integrated undertaking active in both of the identified markets. During the period investigated, two of its business divisions – BT Openworld and BT Retail – supplied residential broadband services. A further business division, BT Wholesale, provided the wholesale services upon which BT’s downstream operations, as well as many competing internet service providers relied as a key input supplying residential broadband services.

1.14 Ofcom considers that BT enjoyed a position of dominance in the upstream market throughout the period covered by the investigation.

1.15 As regards the downstream market, Ofcom finds that BT was active on the downstream market for residential asymmetric broadband internet services such that

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\(^2\) See case 322/81 Michelin v Commission [1983] ECR 3461, paragraph 57

\(^3\) Excluding the Hull area: the area defined as the “Licenced Area” in the Licence granted on 30 November 1987 by the Secretary of State under section 7 of the Telecommunications Act 1984 to Kingston upon Hull City Council and Kingston communications (Hull) plc.
its pricing decisions were capable of influencing the conditions of competition downstream.

**Abuse of a dominant position**

**The test for margin squeeze**

1.16 Ofcom has applied the following criteria for determining whether an undertaking has engaged in margin squeeze:

(a) The undertaking in question must be vertically integrated, operating in related upstream and downstream markets;

(b) The undertaking must enjoy a dominant position in the upstream market;

(c) The undertaking must be active in the downstream market such that its pricing decisions in that market are capable of influencing downstream competitive conditions;

(d) The margin between the price charged by the undertaking for the upstream input and the price charged by the undertaking for the downstream product must be insufficient to cover the costs of the undertaking's downstream operations (or those of an equally efficient operator); and

(e) There must be no valid objective justification for the undertaking's conduct.

**Ofcom's analysis of BT's financial performance**

1.17 Ofcom has conducted a detailed analysis of BT's financial performance during the period investigated in order to determine whether the margin between BT's upstream and downstream prices was sufficient to enable its downstream operations to trade profitably.

1.18 First, Ofcom has analysed BT's historical accounting data for the period investigated. Ofcom's starting point for this analysis was BT's management accounts which showed that its downstream operations were loss making throughout the period. Ofcom has then adjusted the data derived from those accounts in various ways in order to obtain a more reliable account of BT's financial performance. Principal adjustments include the addition of relevant costs omitted from the management accounts; and capitalisation and amortisation of development and expenditure costs which in the management accounts are written off when they are incurred; and adjustments to convert costs to the appropriate costs standard for this case, namely long run incremental costs.

1.19 Ofcom's assessment of BT's historical accounting data shows that BT did in fact incur losses during the period under investigation. However, Ofcom considers that, in the circumstances of this investigation, an analysis based on historical accounting data alone is not sufficient to warrant a finding of infringement. It is not unusual for losses to be incurred by all operators in the early period of a dynamic market in the expectation of recovering such losses later.

1.20 Accordingly, Ofcom has also examined BT's financial performance by means of NPV calculations, to arrive at an estimate of the future profitability of BT's downstream
operations. Such calculations serve to test whether the historical losses incurred by BT during the period of the current investigation may be recoverable from causally related future profits within reasonable timescales and under competitive conditions.

1.21 During the period investigated, BT prepared business plans on a quarterly basis, which included regulatory NPV calculations aimed at determining its compliance with the requirements of Article 102 TFEU and the Chapter II Prohibition. Those calculations consistently produced positive results, i.e. they suggested that BT's downstream operations would be profitable over the period considered in the plan.

1.22 These business plans formed the starting point for Ofcom's NPV analysis. Ofcom examined BT's NPV calculations and considered that these required adjustment before they could be used for the purposes of a competition law assessment. Ofcom has therefore made various adjustments to BT's NPV calculations in order to arrive at an assessment of future profitability that is more appropriate for the purposes of a margin squeeze analysis.

1.23 In conducting its analysis, Ofcom considered it appropriate to consider both an NPV analysis commencing on 1 June 2002 and one commencing on 1 January 2004. This distinction between the two periods results from a number of factors and, in particular, the fact that, prior to the end of 2003, the consumer broadband market involved newly developing services in a dynamic and rapidly evolving market. Ofcom also recognised that the assessment of NPV relies on a number of assumptions and that BT could not have been aware of Ofcom's preferred approach to those assumptions until November 2003. Ofcom therefore conducted an NPV analysis for each period.

1.24 Ofcom made provisional findings of an infringement on the basis that the analysis of both the historical data and the NPV analyses produced negative results, following Ofcom's various adjustments. In response, BT provided new financial information relating to the "additional relevant costs" incurred during the period investigated and new arguments as to the correct methodology to be applied in calculating the costs that should be added for subscribers acquired prior to the period investigated.

1.25 Having reviewed BT's response, Ofcom has concluded that its NPV analyses require further adjustments to incorporate the new data provided by BT and in recognition of BT's methodological objection which appears to Ofcom to be partly valid. Following those adjustments, Ofcom's NPV analysis for the period from 1 January 2004 produces positive NPVs under a range of plausible scenarios. The NPV analysis for the period from 1 June 2002, however, remains negative.

1.26 For the reasons set out in Section 4, Ofcom has conducted a sensitivity analysis in relation to the NPV analysis from 1 June 2002 and the negative results produced do not appear to Ofcom to be robust to changes in the underlying assumptions in this case. Before finding an infringement of Article 102 TFEU and/or the Chapter II Prohibition, Ofcom must satisfy itself on the basis of strong and compelling evidence that an infringement has occurred. In light of the above, Ofcom does not consider that the evidence in this case is sufficient to support a finding that BT abused its dominant position during the period under investigation particularly when the following factors are taken into account:

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a) the period of investigation for which negatives are observed relates to markets at a fast moving and dynamic early stage of their development;

b) the analysis involves an assessment of contemporaneous financial forecasts contained in business plans prepared for informing management decisions which are by their nature subject to a degree of uncertainty;

c) the analysis involves Ofcom making a number of assumptions and complex calculations using these business plans as a starting point, where small changes in those assumptions may change the outcome of the NPV analysis.

1.27 Ofcom has therefore concluded that BT has not abused its dominant position in this case.
Section 2

The relevant markets

Introduction

2.1 As set out at paragraph 1.16 above, in conducting an assessment of whether or not there has been an abuse of a dominant position, contrary to the Chapter II Prohibition and/or Article 102 TFEU, it is necessary to assess whether an undertaking is dominant on a relevant market. In order to do so, it is necessary to conduct an assessment of the boundaries of the relevant market before proceeding to evaluate the market power of an undertaking within that market.

2.2 The complaint and Ofcom’s subsequent investigations concern pricing policies employed by BT for wholesale products which act as inputs to retail broadband products used for accessing the internet by end users. This section sets out the background to the development of the internet in the United Kingdom before considering the products offered at both retail and wholesale level for offering internet access, in particular those products offered by BT, before defining the relevant markets.

2.3 The assessment below relates solely to the period of investigation, namely 1 June 2002 to 31 December 2004. Significant changes have taken place within the market place since 31 December 2004 at a technological, regulatory and competitive level. In particular, the growth of use of local loop unbundling (“LLU”) services has transformed the manner in which retail and wholesale broadband services are provided. As a result, the competitive landscape in place today bears little resemblance to that in place during the period of investigation. Greater competition now takes place at a deeper level within broadband networks and retail operations are therefore far less dependent on wholesale inputs from BT.

2.4 Furthermore, the products which are the subject of Ofcom’s investigation have now been superseded by different wholesale products, more adapted to the technological and competitive conditions now prevailing. Therefore, Ofcom’s analysis is purely historic. The market definition analysis engaged in by Ofcom is limited solely to the period of investigation and is unlikely to be applicable to today’s market (or markets) for retail and wholesale broadband products.

The development of the internet in the United Kingdom

2.5 Since its development in the 1980s as a means of connecting computers in academic institutions, the internet has developed into an important part of the world’s economy and everyday life for many individuals and organisations in the UK.

2.6 When using the internet, information is sent to and from the user’s computer to other computers. The connection of a user’s computer to the internet (“retail internet access”) can be achieved using various different technologies and carried over different media (for example, over cable or telephone lines, via satellite or using wireless technologies). In this Decision and generally, companies who offer retail internet access services are termed ‘internet service providers’ (“ISPs”).

2.7 An important characteristic of an internet access service is the speed at which information is transferred to and from a user’s computer. For many purposes, higher speeds (or ‘bandwidth’) are important to users and enable a wider range of
applications to be used effectively. Reflecting the fact that for many common applications users wish to receive more data than they transmit, it is common for an internet access service to be 'asymmetric'; that is, they have a higher 'download' speed (the speed at which data is received from the internet by the user's computer) and lower 'upload' speed (the speed to which data is sent from the user to the internet).

2.8 Historically, internet access services have been characterised as either narrowband or broadband, depending partly on the download speed available (alongside other characteristics). During the period covered by this Decision, a typical narrowband download speed was 56 kilobits per second ("kbit/s") while a typical broadband download speed was 512kbit/s or more. A definition of broadband is provided in paragraph 2.14 below.

**Retail internet services**

**Narrowband internet services**

2.9 Residential internet services in the UK have been available on a commercial basis since around 1992. Internet access began using 'dial-up' modems, with speed improving until download speeds of up to 56kbit/s became commonplace. Dial-up internet services enable access to the internet using a modem which connects to the internet via the customer's domestic telephone service whenever they want to use the service. Dial-up services were initially only available on a 'metered' basis (that is, charged per minute) with consumers paying the price of the phone calls they made to use the internet (known as 'pay-as-you-go'). Some ISPs also charged a monthly subscription for the service.

2.10 Competing retail narrowband internet services delivered using BT's network was encouraged by regulatory action by the Director to require BT to offer flat rate internet access call origination ("FRIACO"). The ability to buy FRIACO from BT on regulated terms allowed other ISPs to offer residential unmetered dial-up internet access to UK customers as from June 2000. Customers choosing unmetered packages paid a monthly fixed fee, which included the price of calls instead of being charged each time they used the service through the price of the phone call.

2.11 The number of narrowband internet users (both residential and small businesses) grew rapidly from the early 1990s exceeding 10 million in 2003 before beginning to decline as users switched to broadband. Despite the arrival of broadband, the use of narrowband services remained significant during the period of investigation. Figure 2.1 shows that by the end of 2004, there were around nine million residential and small business narrowband connections in the UK, accounting for almost 60% of all residential and small business connections. This is compared to a decline to almost 22% of connections by the end of 2006.

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5 For example, an application such as e-mail may function at high or low speeds, whereas provision of real-time two-way voice communication (‘voice over internet protocol’, or “VoIP”) is likely to require a higher speed. Another advantage of higher bandwidth is that it may allow more users to share a connection for a given application.


8 Ofcom: The UK Communications Market 2007, see footnote 7
2.12 Internet access is also supplied over cable networks. Cable networks were originally designed to carry analogue television and radio channels, and from 1993 were able to offer telephone services. Dial-up internet access was initially available using the twisted copper pairs which provided cable telephony services. Subsequently, the networks were upgraded to provide broadband services.

2.13 There were originally many regional franchise cable companies but by 1999, following a decade of consolidation, ntl and Telewest were the only two major players remaining in the market during the period considered in this investigation.

Retail broadband internet services

Background

2.14 In the exercise of its sectoral powers, Ofcom has defined broadband services as demonstrating three characteristics:

a) the service is always-on, i.e. no dial-up is required. This feature allows the user to maintain a permanent connection to the network so allowing real time delivery of services such as e-mail;

b) it is possible to use both voice and data services simultaneously, whether they are provided together, for example over the same access route, or separately, perhaps using more than one access route; and

c) it has a faster downstream speed than a dial-up connection.

2.15 During the period of the investigation, the two most prevalent methods used to offer broadband internet access were.

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9 The Government’s Duopoly Review, which began in 1991, led to the liberalisation in the cable sector, including modification of licences from 1993 which enabled cable companies to offer telephony services alongside broadcasting.

10 Cable broadcasting networks are based on a combination of optical fibre and coaxial cable. Television and broadband are delivered via coaxial cable, while telephone services are delivered over twisted copper pairs that run alongside the coaxial cable into the home.


a) **Asymmetric Digital Subscriber Line ("ADSL"):** These services provide a connection to the internet that uses the same copper line as conventional telephony and, unlike narrowband services, permits the use of the voice service at the same time as the internet access service. The service is also ‘always on’ and can be used to send a large quantity of data in one direction and a smaller quantity in the other (hence ‘asymmetric’). ADSL was introduced over the BT network in 2000.

b) **Cable:** These services are provided over a cable network connection and use devices (‘cable modems’) that enable a subscriber with cable access to be provided with an ‘always-on’ connection to the internet and use a voice service at the same time. The service is also typically asymmetric.

2.16 Broadband internet access can also be provided using satellite, wireless, powerline (data conveyed over electricity cables) and optical fibre-based technologies. During the period considered in this investigation these technologies in aggregate supplied (on average) less than 1% of the market and are therefore not considered in detail.

2.17 The first retail broadband internet services became available in 1999, offered by cable companies and subsequently ISPs using BT’s telephone network (including BT itself). However, before retail broadband services could be made widely available, both BT and the cable companies had to install additional equipment to ‘enable’ their respective networks.

2.18 The UK cable companies started enabling their hybrid fibre/coaxial networks for broadband in 1999. By the end of 2007, around 49% of UK homes were passed by a cable network that had been enabled to provide broadband.

2.19 BT began a programme of upgrades to offer ADSL-based broadband in July 1999. Between 2000 and 2004, BT increased the number of its local exchanges able to support ADSL, reaching 90% of UK households by May 2004. Coverage expanded to essentially all local exchanges, with the result that, by December 2004, 96% of all homes were broadband enabled. By the end of 2007, broadband was available to around 99.6% of premises.

2.20 BT launched its first retail residential broadband services in August 2000. Shortly after it began offering its own retail service, BT made available a wholesale ADSL service known as IPStream 500. BT’s wholesale services are set out below.

2.21 As at December 2004, BT was the second-largest retail broadband provider in the UK. Its UK broadband service provision share of retail connections was 24%

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13 Ofcom’s WBA Market Review, 13 May 2004 (see footnote 12).
14 Cable broadcasting networks are based on a combination of optical fibre and coaxial cable TV and broadband are delivered via coaxial cable, while telephony services are delivered over twisted copper pairs that run alongside the coaxial cable into the home.
16 Digital Subscriber Line Access Multipliers (“DSLAM”), a piece of equipment that is installed at the exchange serving DSL enabled customer lines, comprising a bank of DSL modems and a multiplexer which combines many customer lines into a single data stream.
18 Ofcom: The UK Communications Market 2007 (see footnote 7).
compared to 34% for ntl:Telewest. By the end of 2007, BT was the largest provider with its share up to 26.5%. \(^{19}\)

2.22 The rapid growth in the number of residential and small business broadband internet connections during the period covered by the investigation is shown in Figure 2.1 above, from almost 1.4 million by the end of 2002 to 6.1 million by the end of 2004. This demonstrates that retail broadband was a nascent and rapidly growing market during the period of the investigation.

2.23 By the end of 2007, there were 15.6 million residential and small business broadband connections in the UK\(^ {20}\) and, as at January 2008, household broadband penetration averaged 58% across the UK.\(^ {21}\)

**BT's retail broadband services**

**BT Openworld Broadband**

2.24 BT began offering retail broadband services in 2000 with the BT Openworld Home 500 product which required engineer installation. This product was offered at the time by a division of BT called BT Openworld.

2.25 On 5 March 2002, BT Openworld launched a 512kbit/s retail broadband service, BT Openworld Home 500 Plug & Go, which could be installed by the customer.\(^ {22}\)

2.26 On 2 September 2003, BT Openworld launched BT Yahoo! Broadband (512kbit/s), a 512kbit/s product.\(^ {23}\) On 19 January 2004 the BT Yahoo! Broadband product range was expanded with the launch of BT Yahoo! Broadband (1Mb), a 1Mbit/s product.\(^ {24}\) These products included a range of value added services such as e-mail addresses, security features and exclusive content. For the purposes of Ofcom's analysis these products are collectively known as “BT Openworld Broadband” throughout this Decision.\(^ {25}\)

2.27 On 10 February 2005, BT announced increases to connection speeds with upgrades to both new and existing customers taking BT Yahoo! Broadband. With

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\(^ {20}\) Ofcom: Telecommunications Market Data Update (see footnote 19).


\(^ {22}\) The launch price for monthly rental was £29.99. In addition, customers had to pay a one-off activation charge of £65, plus a one-off charge of £85 for modem and microfilters; together referred to as customer premises equipment (“CPE”). Microfilters are fitted to a customer’s telephone socket and split the line so that the frequencies used for broadband are isolated from the frequencies used for voice. This enables the customer to use voice and data services at the same time. BT Openworld Home 500 Plug & Go was launched with a special offer waiving the £65 activation charge, which was extended to 31 August 2002. From 13 January 2003, BT Openworld permanently removed the £65 activation charge.

\(^ {23}\) At launch, the monthly rental for BT Yahoo! Broadband (512kbit/s) was £29.99. The rental charge was reduced to £26.99 per month from 1 July 2004 and CPE charges were reduced to zero for customers ordering online (£25 for those ordering offline, i.e. by telephone). A monthly usage cap of 15GB per month was introduced at that time.\(^ {24}\) At launch, the monthly rental for BT Yahoo! Broadband (1Mbit/s) was £40.99. This was reduced to £29.99 per month from 1 July 2004. CPE charges were reduced to zero for customers ordering online (£25 for those ordering offline, i.e. by telephone) and a monthly usage cap of 30GB per month was introduced.

\(^ {25}\) Although the monthly rental charges for the BT Openworld Broadband services remained stable over the period, the total price to consumers varied due to a variety of special offers in force at different times. BT ran a number of special offers, including discounted CPE prices, free rental for the first month, and cashback offers for heavy narrowband users upgrading to broadband. BT also imposed a £1 per month surcharge on all its retail broadband services (including, at 1 July 2004, BT Yahoo! Broadband) for customers not paying by Direct Debit or monthly payment plan.
prices, monthly usage limits and other service attributes unchanged, both the 512kbit/s and the 1Mbit/s products would be upgraded to provide customers with 2Mbit/s access. This process began on 17 February 2005. Those customers previously on the 512kbit/s product were offered BT Yahoo! 2Mbit/s with a 15GB monthly usage cap (at the unchanged price of £26.99) and those previously on the 1Mbit/s product were offered BT Yahoo! 2Mbit/s with a 30GB monthly usage cap at £29.99. These products were made available to new customers on the 17 February and 24 March respectively.

**BT Retail Broadband**

2.28 Separately, on 5 June 2002, BT Retail, another division of BT, launched its own retail broadband service called BT Broadband (a 512kbit/s service).26 BT expanded the BT Broadband product range with the introduction of a 1Mbit/s service on 19 January 2004.27 BT Broadband was a connection-only service which did not include the range of value-added services which were included with BT Openworld Broadband.28

2.29 On 1 March 2004, BT introduced BT Broadband Basic, BT’s first retail broadband service to offer monthly rental for less than £20.29 For the purposes of Ofcom’s analysis these products are collectively known as “BT Broadband” throughout this Decision.

2.30 The creation of the Broadband Basic product was part of a new strategy and direction by BT to create a ‘Broadband Family’. The broadband family was a range of products offering different functionality according to customer requirements with BT Yahoo! Broadband offering the most features and BT Broadband Basic the least.

2.31 On 10 February 2005, BT announced increases to connection speeds with upgrades to both new and existing customers taking both BT Broadband and BT Broadband Basic. With prices, monthly usage limits and other service attributes constant, the 512kbit/s BT Broadband product was upgraded to a 2Mbit/s service and the 512kbit/s BT Broadband Basic product upgraded to a 1Mbit/s service.30

**Wholesale broadband services**

**Background**

2.32 BT launched retail broadband services in early 2000 but did not offer any wholesale broadband services until after that time. The first wholesale service made available by BT to other network providers, ISPs and large corporate customers was

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26 BT Broadband was launched at a monthly rental price of £27 (or £28 for customers not paying by Direct Debit or monthly payment plan), plus a one-off £60 activation charge (cut to £40 for customers ordering online, £50 offline, from 1 April 2003). The monthly rental price was reduced to £24.99 per month effective from 1 July 2004. CPE charges were reduced to zero for customers ordering online (£25 offline).
27 The 1Mbit/s service was priced at £38 for monthly rental. This was reduced to £28.99 per month, effective from 1 July 2004. CPE charges were reduced to zero for customers ordering online (£25 offline).
28 Like BT Openworld Broadband, the total price to consumers of BT Broadband was influenced by a number of special offers from the time of its launch.
29 BT Broadband Basic was introduced with a monthly rental of £19.99, though this was reduced to £17.99 per month from 1 October 2004. BT Broadband Basic had a usage cap of 1GB per month, though this was not enforced until 1 August 2004 when customers had to pay additional charges for exceeding the cap.
30 BT offered the 2Mbit/s service to all new customers at £24.99 from 17 February 2005 and began upgrading the existing customer base from the same date. The new Broadband Basic 1Mbit/s service was offered to new customers from 24 March 2005 and began upgrades to customers already taking BT Broadband Basic on 1 April 2005.
2.33 Around that time, communications providers were seeking other forms of wholesale broadband services to enable them to compete in the retail market. In 2001, two communications providers (Energis and THUS) asked the Director to resolve a dispute about interconnection with BT's ATM (Asynchronous Transfer Mode) network. ATM is a method of transferring data in 'packets' (of data) of a fixed size.

2.34 Energis and THUS wanted BT to provide an ATM interconnection service that could be used as wholesale broadband access. This service would (they argued) allow them to compete with IPStream in offering wholesale intermediate services (coupled with advantages they expected to arise from the use of their own networks and product innovation).

2.35 On 21 June 2002, the Director resolved the dispute, issuing a Direction ("the ATM Direction") requiring BT to reach agreement with Energis and THUS to offer, on a non-discriminatory basis, an ATM interconnection service meeting their requirements. This product is known as 'DataStream'. In May 2004, through a Direction under the Network Access SMP condition in the WBA Market Review, BT was required to provide wholesale ATM interconnection on a 'retail minus' basis and comply with a rule prohibiting margin-squeeze.

2.36 In addition, on 26 August 2004, Ofcom made a Direction setting the margin between DataStream and IPStream. Together with the Network Access SMP condition and the direction under it, this Direction replaced the ATM Direction.

2.37 On 9 August 2004, following a complaint, Ofcom made a Direction relating to terms, conditions and charges for broadband access migration, notably migration between IPStream and DataStream.

2.38 Broadband providers’ ability to migrate customers between different broadband services and service providers is an important element of retail broadband competition. In order to be able to compete effectively, an entrant must be able to compete for existing connections as well as new connections (otherwise the new entrant would have to win an unfeasibly large proportion of new connections to enter the market). BT reduced its charges for broadband access migration (IPStream to DataStream) to £11 on 1 June 2004, in line with Ofcom’s proposals. Prior to this, BT had charged £50 for broadband access migration services.

2.39 Regulation of BT’s local access network (LLU) came into being through Condition 83 of BT’s licence, later augmented with the introduction of Regulation 2887/2000/EC which requires BT to meet reasonable requests for unbundled access to local loops and related facilities on fair and transparent and non-discriminatory conditions, to publish a reference offer and to have cost oriented prices.

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31 Direction to resolve a dispute between BT, Energis and Thus concerning xDSL interconnection at the ATM switch [http://www.ofcom.org.uk/static/archive/offtel/publications/broadband/dsl/atmi0602.htm](http://www.ofcom.org.uk/static/archive/offtel/publications/broadband/dsl/atmi0602.htm).
32 A condition imposed on BT as a result of the WBA Market Review.
2.40 The Director issued a Determination in December 2000 setting the charges for fully unbundled loops and internal tie cables (this Determination was rolled over in March 2002) and a Determination in October 2001 setting the charges for shared loops. The Director subsequently issued further Determinations setting charging principles for external tie cables and escorted access, and setting charges for power supplies. The Director also made a number of Determinations relating to non-charging issues.\(^{35}\)

2.41 Pursuant to its obligation to carry out reviews of competition in telecommunications markets, Ofcom carried out a review of the wholesale local access market which considered what regulation should apply in this market and specifically in respect of unbundled local loops. Ofcom published its final proposals for consultation on 26 August 2004.\(^{36}\) Following that, on 16 December 2004, Ofcom published its final statement and announced final connection and rental charges for LLU services which came into effect from 1 January 2005.\(^{37}\)

2.42 In 2004 Ofcom began a Strategic Review of the Telecommunications Sector (“TSR”) which was designed to establish a strategic approach for Ofcom on how to implement the EU regulatory framework in the UK, in particular by assessing how effective and sustainable competition in the telecommunications markets can be achieved while having regard for investment and innovation. On 22 September 2005, as a conclusion of the TSR, Ofcom accepted from BT undertakings in lieu of a reference under Part 4 of the Enterprise Act 2002.\(^{38}\)

2.43 The purpose of the undertakings is to tackle the problem of inequality of access to the fixed telecommunications network, mainly by: (i) supporting organisational changes by ensuring a certain operational separation within BT; and (ii) creating equivalence of input at the product level. The most visible result of the requirement of operational separation is the creation of a separate division within BT, referred to in the Undertakings as ‘Access Services’ (or “AS”), and known to consumers and customers of BT under its brand name ‘Openreach’. Ofcom continues to monitor the implementation of the undertakings and publishes regular updates to this effect.

The products

2.44 During the period under investigation, ISPs required certain wholesale inputs in order to provide retail services to consumers. This chain may be illustrated by the following diagram:

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\(^{35}\) All Directions and Determinations made by the Director in respect of LLU are published at: [http://www.ofcom.org.uk/static/archive/oftel/publications/broadband/llu/index.htm](http://www.ofcom.org.uk/static/archive/oftel/publications/broadband/llu/index.htm).


\(^{38}\) [http://www.ofcom.org.uk/static/telecoms_review/index.htm](http://www.ofcom.org.uk/static/telecoms_review/index.htm).
2.45 The chain of inputs starts with the connection between a customer’s premises and a network operator’s site (for example, a local exchange). This is known as the ‘local loop’. The process of granting access to the local loop is known as LLU. Access to LLU products allows operators other than BT to interconnect at a deeper level within BT’s network and thus offer a broader range of services.

2.46 The chain continues through various links in a network that carry signals; the provision of a connection to the internet itself; through to the provision of complementary internet services (such as e-mail or the hosting of a user’s website) in some cases; and finally the retail services.

2.47 During the period of investigation, ISPs were able to choose which elements within the chain they wished to buy from other suppliers as a wholesale input, and which they supplied themselves. Their choices reflect, amongst other things, the extent of their own network infrastructure. This varies greatly amongst ISPs. Some ISPs purchase almost all of the elements in the chain and therefore do not own or operate those elements themselves – for example ntl:Telewest (now rebranded as Virgin Media) provided a ‘virtual ISP’ to Tesco during the period of investigation.39 By contrast, ISPs such as TalkTalk rent the copper local loop to the customer premises from BT and then provide all additional inputs (from exchange equipment through to retail services) themselves. BT and Virgin Media (in areas where it has cable network) self-provide all parts of the chain of inputs.

2.48 Figure 2.3 below shows the breakdown of connections between different types of operator. By the end of December 2004, three suppliers (BT, ntl and Telewest) provided 100% of all wholesale broadband lines in the UK. By the end of 2007, BT

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and Virgin Media provided 75% of all wholesale lines (excluding the provision of LLU services by BT).

**Figure 2.3: Wholesale broadband connections 2001 to 2007**

![Wholesale broadband connections 2001 to 2007](image)

*Source: Ofcom / operators*

### BT's wholesale broadband services

2.49 During the period, BT provided a number of different wholesale services to itself and other ISPs which provide different elements of the chain set out above at Figure 2.2. BT chose to offer these services via its business division, BT Wholesale.

2.50 The first group of wholesale services made available by BT to other network operators, ISPs and large corporate customers was IPStream which was made available on 29 August 2000. This group of services enables an ISP to use BT's local loop, exchange equipment, backhaul (part of the transmission network) and core network, with or without internet connectivity. The ISP then provides its own internet services and retailing. In Figure 2.2 above, this is represented by "intermediate services". Variants of the IPStream service allow the inclusion by BT of internet connectivity and/or internet services (although the sole purchaser of the most 'complete' variant is BT's own BT Retail division). Most ADSL connections in the UK were provided using one of BT's IPStream services during the period covered by this investigation.

2.51 Until 28 May 2004, the overall IPStream service offered by BT consisted of three basic elements:

a) a connection between the subscribers' premises and the BT local exchange (using the local access network);  

b) conveyance from BT’s local exchange to a router in BT’s high speed data network (which, together with the end-user access, is colloquially known as 'IPStream'); and

c) aggregated delivery to the ISP, using a leased line between BT’s high-speed data network and their site (over a circuit branded as ‘BT Central’).

2.52 The combination of the IPStream and BT Central products offer a service depicted as an intermediate service in Figure 2.2. Somewhat confusingly, the combination of

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40 Note that the subscriber separately (and necessarily) purchases retail line rental from BT.
IPStream and BT Central products was colloquially also referred to as IPStream. In the subsequent paragraphs, references to IPStream are references to the service described at [(a) and] (b) above.

2.53 At the beginning of the period under investigation, BT offered products on a standard charging basis. IPStream (Standard) consisted of the end user ADSL connection and conveyance across BT’s high-speed data network and was sold on a per end user basis. BT Central (Standard) was simply a leased line and was sold as capacity. BT levied a connection and a rental charge for both of these products.

2.54 Over the period of the investigation, BT subsequently introduced two additional charging arrangements for its wholesale services. On 28 May 2004 BT introduced its Capacity Based Charging (“CBC”) price structure and on 30 December 2004 BT introduced its Usage Based Charging (“UBC”) price structure. The combination of products used, IPStream and BT Central, is technically identical in each case, only the pricing structure changes. Under the three pricing structures, BT charges differently for each of these distinct elements. There is, however, room for confusion, as BT uses the same product name when referring to different combinations of network elements.

2.55 IPStream (CBC) is just the end user ADSL connection and is sold on a ‘per end user’ basis. BT Central (CBC) consists of conveyance across BT’s high-speed data network and a leased line and is sold as capacity. BT levies a connection and a rental charge for both of these products.

2.56 The UBC structure differs from Standard and CBC in that each of the three network parts are sold separately. Thus, IPStream (UBC) is just the end user ADSL connection and is sold on a per end user basis (same as IPStream (CBC)). BT Central (UBC) is simply a leased line and is sold as capacity (same as BT Central (Standard)). Conveyance across BT’s high-speed data network is sold separately based on usage.

2.57 Regardless of the pricing structure taken, ISPs need to complete the connection from the end user’s site to the internet by securing internet connectivity. Internet connectivity is offered by a number of network providers, including BT. Over the period of the investigation, BT offered NetFlex, which is a standalone internet connectivity product or alternatively IPStream with ‘BT Central Plus’, which is a combined service of BT Central and internet connectivity product in a single package. This product differs from BT Central because it also includes the provision of internet connectivity (known as peering services) which would otherwise be self-supplied or purchased through another party by the ISP. All the IPStream service bundles provide limited flexibility to ISPs (for example, they are not able to vary contention ratios or service levels)\(^{41}\) as the technical characteristics of the ADSL connection and routing is managed by BT Wholesale.

2.58 The second group of services provided by BT, branded ‘DataStream’, enable an ISP to purchase a less complete, more flexible form of access, albeit at the expense of the need for greater initial investment by the ISPs in network equipment and the effort required to manage their own internet protocol network.\(^{42}\)

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\(^{41}\) Contention occurs when multiple users are contending for the same line or server for broadband at all speeds. It is often expressed as a ratio, such as 50:1 meaning 50 users are sharing the same bandwidth.

\(^{42}\) Put more precisely, DataStream provides interconnection with BT’s underlying transmission network (that uses a protocol called ATM) rather than interconnection with the ‘higher’ IP layer. The ISP is able to interconnect their
DataStream permits more flexibility for the resulting retail service (for example, the ISP can vary the ‘contention ratio’ (i.e. the number of times a given line capacity is provided to users)). In some situations, DataStream can provide a lower long-run cost than the use of IPStream and BT Central. An example of the flexibility DataStream provides is its use by Tiscali (now part of TalkTalk) which was able to introduce mid-band products which are cheaper to the customer than higher-speed services (and not economic to deliver using an IPStream/BT Central input).

Finally, LLU is the offering by BT of an access service which enables the ISP to purchase access to the copper access line connecting BT’s local network to a customer’s premises. No other communications service is included in the LLU service, meaning that the ISP installs its own equipment in the local exchange and only buys access to the physical transmission medium from BT.

Thus, ISPs who wished to offer broadband services over the BT network during the period covered by the investigation had three options for the purchase of wholesale inputs:

a) They could purchase a relatively complete service from BT (IPStream + BT Central) and brand and market it themselves, but with limited scope for distinguishing their services from BT’s own retail services;

b) They could interconnect using the same technology as BT’s transmission network (DataStream, using ATM) and invest in their own internet protocol network, although with a higher requirement for capital investment than the use of IPStream with BT Central; or

c) They could purchase access to BT’s copper lines and install their own equipment at BT’s exchange including links to their own backhaul (possibly leased) and core network, which has the highest requirements in terms of investing in their own network, but also provides complete control of the technical characteristics of that network.

Identifying relevant markets

The preceding paragraphs provide an overview of the means of delivery of internet services (in particular, broadband services) in the United Kingdom during the period under consideration. This background is helpful in informing the analysis of the relevant markets to be considered in conducting Ofcom’s assessment in the present case.

The relevant market has two dimensions: the relevant goods or services (the product market) and the geographic extent of the market (the geographic market).

These dimensions may be broadly defined as follows:

a) a relevant product market comprises all those goods and/or services which are regarded as interchangeable by any reason of the products’ characteristics, prices and intended use; and

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43 Office of Fair Trading ("OFT") 2004 competition law guideline, Market Definition, paragraph 2.15.
b) the relevant geographic market is the area over which substitution takes place.  

Identifying the relevant product market

2.65 In Aberdeen Journals, the CAT stated that, in assessing the relevant product market:

“[t]he key idea is that of competitive constraint: do the other products alleged to form part of the same market act as a competitive constraint on the conduct of the allegedly dominant firm?”  

2.66 The European Commission (the “Commission”) has provided guidance on how it applies the concept of the relevant product market in practice in its Notice on market definition. The Notice describes the sorts of information that may be used to define relevant product markets. These include product characteristics and intended use, evidence of substitution in the recent past, the views of customers and competitors, consumer preferences, barriers and costs associated with switching demand to potential substitutes and different categories of customers and price discrimination. Supply-side substitution may also be relevant to a definition of the relevant market, where its effects are sufficient to constrain pricing behaviour within the relevant timescale.

2.67 The ‘hypothetical monopolist test’ is a useful tool to identify close demand side and supply side substitutes. Ofcom will generally start by taking a narrow view of the market and then determine whether the market definition should be widened to include other products. A set of products is considered to be in a separate market if a hypothetical monopoly supplier could impose a small but significant, non-transitory relative price increase (in the range of 5% to 10%), or “SSNIP”, above the competitive level without losing sales to such a degree as to make this unprofitable. If such a price rise would be unprofitable because of substitution, then the market definition should be expanded to include the substitute products.

2.68 Demand-side substitution occurs if consumers would switch to other products in response to the price increase. Supply-side substitution occurs if suppliers of other products would begin to compete with the hypothetical monopolist in the supply of the product under investigation in response to the price increase within the relevant timescale.

2.69 It is also appropriate to consider whether different customers, services and areas are subject to a common pricing constraint and should therefore also be included in that same market. A common pricing constraint is generally used to define the market when there are indications that there are additional constraints on firms’ behaviour, which override the absence of demand- or supply side substitutability.

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Such constraints may exist for example where consumers have a preference for purchasing a bundle of services from a single supplier rather than on a service-by-service basis. Failure to consider the existence of a common pricing constraint could lead to unduly narrow markets being defined.

**Identifying the relevant geographic market**

2.70 The geographic boundary of the relevant market is defined using the same approach as the product market definition, that is, by using the hypothetical monopolist test to inform judgments as to demand- and supply side substitutability, and considering evidence as to the existence of a common pricing constraint.

2.71 For geographic markets, the hypothetical monopolist test asks whether a price increase in the narrowly defined area would encourage operators outside the area to begin to offer services to customers in the area and/or whether customers could switch to suppliers located outside the area. The existence of a common pricing constraint can also be relevant to the consideration of relevant geographic market boundaries.

2.72 Also relevant is paragraph 56 of the Commission’s Guidelines on market analysis and the assessment of market power, which states that in cases where there is a sufficient degree of variety in competitive conditions between areas, distinct local markets should be defined. To the extent that competitive conditions in different areas are sufficiently homogeneous, different areas are to be found to be in the same relevant geographic markets.

2.73 Even where competitive conditions do differ between areas, it can be the case that uniform pricing constraints exist across geographic areas, such that a single price emerges to reflect competitive conditions. In this scenario, the uniform pricing constraint would lead to a finding of a broader geographic market, where competitive conditions differing by area would otherwise imply a narrower geographic market definition.

**Upstream and downstream markets**

2.74 For the purposes of this investigation, there are two relevant markets:

a) the downstream market in which the effect of any conduct carried on by BT may occur; and

b) the upstream market, in which BT may hold a dominant position.

2.75 Ofcom’s analysis considers the downstream market first, and then considers the upstream market. This is since demand for the upstream service is a derived demand, i.e. the level of the demand for the upstream input depends on the demand for the retail service.

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50 Such consumer preferences can lead to what are known as demand side economies of scope, and lead to the definition of ‘cluster’ markets.

The downstream market

Introduction

2.76 Ofcom considers that the relevant downstream market is the market for residential asymmetric broadband internet access services in the UK. This section begins by identifying the relevant product market and then considers the relevant downstream geographic market.

Product market

2.77 In identifying the relevant product market, Ofcom has analysed product functionality and pricing to identify possible substitute products and as a pre-requisite to applying a SSNIP test. Customers are most likely to switch to products which offer equivalent or at least substantially similar functionality at broadly similar prices in response to a small price increase.

2.78 Ofcom has also drawn on market research published by Oftel during the period under investigation which was conducted among residential and SME consumers. These surveys have been used to inform consumers’ likely switching behaviour in response to a hypothetical price increase.

2.79 The starting point for the assessment of substitution is BT’s asymmetric broadband internet access services supplied to residential customers. During the period under investigation, these services were provided via ADSL-enabled metallic telephone lines with download speeds between 512kbit/s and 1Mbit/s. In considering the question of potential substitutes for these services, Ofcom has considered the characteristics of other internet access services that were supplied to residential customers during the period covered by the investigation as set out in Table 1 below.

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52 Conducted among a representative sample of UK adults (by sex, age, social grade, region and employment status and representative of cabled/non cabled areas, rural/urban areas, and levels of deprivation) and weighted to be representative of the UK adult population.

53 Conducted among a representative sample of small (1-50 employees) and medium (51-250 employees) businesses, weighted to be representative of UK SMEs as a whole (97% small businesses; 3% medium businesses).


The surveys listed here represent the total number of surveys conducted by Oftel/Ofcom during the period of the investigation and which are relied upon in Ofcom’s analysis of the relevant product market.

55 BT currently offers speeds of up to 20Mbit/s across its product range.
Table 1: Residential internet access services September 2002, August 2004 and December 2004

<table>
<thead>
<tr>
<th>Service</th>
<th>Price (monthly rental - £)</th>
<th>Download speed (kbits unless specified otherwise)</th>
<th>Type</th>
<th>Other functionality</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sep.02</td>
<td>Aug.04</td>
<td>Dec.04</td>
<td>Sep.02</td>
</tr>
<tr>
<td>Unlimited dial-up</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AOL AnyTime</td>
<td>14.99</td>
<td>15.99</td>
<td>15.99</td>
<td></td>
</tr>
<tr>
<td>BT Yahoo! AnyTime</td>
<td>12.49</td>
<td>12.49</td>
<td>12.49</td>
<td></td>
</tr>
<tr>
<td>Tiscali</td>
<td>15.99</td>
<td>15.99</td>
<td>15.99</td>
<td></td>
</tr>
<tr>
<td>Telewest</td>
<td>12.00</td>
<td>14.00</td>
<td>14.00</td>
<td></td>
</tr>
<tr>
<td>&quot;Entry level&quot; broadband</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AOL/AOL Silver</td>
<td>-</td>
<td>15.99</td>
<td>15.99</td>
<td>-</td>
</tr>
<tr>
<td>Tiscali (150)</td>
<td>-</td>
<td>17.99</td>
<td>17.99</td>
<td>-</td>
</tr>
<tr>
<td>Tiscali (255)</td>
<td>19.99</td>
<td>17.99</td>
<td>17.99</td>
<td>255</td>
</tr>
<tr>
<td>Telewest</td>
<td>-</td>
<td>19.99</td>
<td>17.99</td>
<td>-</td>
</tr>
<tr>
<td>rnt (150)</td>
<td>17.89</td>
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<td>150</td>
</tr>
<tr>
<td>&quot;Restricted&quot; broadband</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wanadoo (Option 1)</td>
<td>-</td>
<td>19.99</td>
<td>17.99</td>
<td>-</td>
</tr>
<tr>
<td>BT Broadband Basic</td>
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<td>17.99</td>
<td>17.99</td>
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<td>&quot;Standard&quot; broadband</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>AOL Broadband / AOL Gold</td>
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<td>24.99</td>
<td>24.99</td>
<td>512</td>
</tr>
<tr>
<td>BT Broadband</td>
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<td>24.99</td>
<td>24.99</td>
<td>512</td>
</tr>
<tr>
<td>Tiscali</td>
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<td>24.99</td>
<td>27.99</td>
<td>512</td>
</tr>
<tr>
<td>BT Yahoo!</td>
<td>-</td>
<td>512</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wanadoo</td>
<td>20.99</td>
<td>24.99</td>
<td>24.99</td>
<td>512</td>
</tr>
<tr>
<td>rnt</td>
<td>24.99</td>
<td>24.99</td>
<td>24.99</td>
<td>512</td>
</tr>
<tr>
<td>Telewest</td>
<td>25.00</td>
<td>25.00</td>
<td>25.00</td>
<td>512</td>
</tr>
<tr>
<td>BT (Broadband)</td>
<td>-</td>
<td>-</td>
<td>24.99</td>
<td>-</td>
</tr>
<tr>
<td>BT (BT Yahoo! Broadband)</td>
<td>-</td>
<td>-</td>
<td>25.00</td>
<td>-</td>
</tr>
<tr>
<td>&quot;1 Mbit/s Plus&quot;</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BT Yahoo!</td>
<td>28.99</td>
<td>29.99</td>
<td>29.99</td>
<td>512</td>
</tr>
<tr>
<td>rnt</td>
<td>34.99</td>
<td>37.99</td>
<td>37.99</td>
<td>512</td>
</tr>
<tr>
<td>Telewest</td>
<td>30.00</td>
<td>35.00</td>
<td>30.00</td>
<td>1Mbit/s</td>
</tr>
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<td>Tiscali</td>
<td>-</td>
<td>50.00</td>
<td>50.00</td>
<td>1Mbit/s</td>
</tr>
<tr>
<td>Restricted &quot;1 Mbit/s Plus&quot;</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BT (BT Yahoo! Broadband 1 Mbit)</td>
<td>-</td>
<td>-</td>
<td>29.99</td>
<td>-</td>
</tr>
<tr>
<td>Wanadoo (Option 2)</td>
<td>-</td>
<td>-</td>
<td>22.99</td>
<td>-</td>
</tr>
<tr>
<td>Wanadoo (Option 3)</td>
<td>-</td>
<td>-</td>
<td>22.99</td>
<td>-</td>
</tr>
</tbody>
</table>

Source: Ofcom from ISP websites (as at June 2005)

2.80 Table 1 above shows that the internet access services that were provided during the period of the investigation had a number of different features which were reflected, to some degree, in the prices charged.
2.81 Over the period of the investigation, broadband services could be broadly placed into one of four categories:

a) entry level;

b) restricted;

c) standard; and

d) 1Mbit/s plus.

2.82 ‘Entry-level’ broadband services were typically lower speed broadband services (between 150kbit/s and 300kbit/s) with enhanced functionality compared to dial-up services (e.g. faster than dial-up, always on, simultaneous voice and data functionality). These services were priced at a small or in some cases no premium to unmetered or dial-up services.

2.83 ‘Restricted’ services offered a capped usage service, where the subscriber faced a maximum monthly download (capacity) limit from the internet. These services were typically provided at speeds comparable to standard services (i.e. 512kbit/s), but were priced as if an entry level service and at a small premium to dial-up services.

2.84 The ‘standard’ and ‘1Mbit/s plus’ categories offered significantly higher download speeds (512kbit/s-1Mbit/s), ‘always on’ and simultaneous use functionality were priced at a significant premium to unmetered dial-up services.

2.85 These four product groupings provide a useful basis for considering how broadband subscribers may make price/functionality trade-offs across different products over the period of the investigation. After August 2004, suppliers (including BT and Wanadoo) introduced restricted usage offers at various price points. These restricted product offerings are set out in Table 1 as at December 2004. For the purpose of the chains of substitution argument analysis in the followings sections, Ofcom’s analysis of price/functionality trade-offs is based upon the four product groupings referred to in paragraph 2.81.

2.86 Ofcom has considered substitution between the following services to determine the boundaries of the relevant downstream product market:

a) BT and other suppliers of ADSL services;

b) cable (and ‘alternative broadband access’ technologies) and ADSL broadband internet access services;

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56 Ofcom recognises that after August 2004, restricted usage products were introduced across a range of price points. Ofcom does not, however, consider these additional products to be representative of the product range over the period of investigation and hence these products are excluded from Ofcom’s formal demand side substitution analysis used to identify which broadband products were in the relevant product market. Nonetheless Ofcom has also considered demand side substitution for some of these new product offerings (between the existing products and the new products and between the new products at different prices) (see footnote 54).

57 The SSNIP test is intended to consider the effect of a price increase from the competitive level. Ofcom recognises that applying a SSNIP to the ‘standard’ broadband price range of ISPs effectively assumes this price range to be the competitive price range. Where actual prices are above this, for example because of the exploitation of market power, there may be a danger of the ‘cellophane fallacy’. This describes a situation in which two products appear to be substitutes at current prices only because one is priced significantly above the competitive level. In line with the OFT Guideline 417, The Application in the Telecommunications Sector, March 2000, Ofcom “will normally proceed on the basis that the current price is at a competitive level unless there is evidence to the contrary”, paragraph 5.19.
c) different categories of broadband services: ‘entry level’, ‘restricted use’, ‘standard’ and ‘1Mbit/s plus’;

d) narrowband and broadband internet access;

e) residential and business broadband internet access;

f) symmetric and asymmetric broadband internet access; and

g) mobile and fixed internet access.

ISPs using ADSL are included in the downstream market

2.87 As shown in Table 1, BT and its competitors who used ADSL services (AOL, Orange and Tiscali) offered very similar services to consumers. This suggests that a 10% rise in the price of ADSL broadband services supplied by BT would have caused sufficient demand side substitution to ADSL broadband services supplied by other suppliers for that price rise to be unprofitable, and hence these services should be included in the same market.

Cable broadband is included in the downstream market

2.88 It can be seen from Table 1 that there was little functional difference between the services offered by suppliers using cable (ntl and Telewest) and ADSL technologies. Both had always on functionality and allowed for simultaneous voice and data whilst providing faster download speeds than dial-up connections. Suppliers using either technology supplied a range of services differentiated on the basis of speed and price, with cable similarly priced as ADSL offerings. This suggests that a 10% rise in the price of higher speed (512kbit/s and above) broadband services supplied via ADSL technology would have caused sufficient demand side substitution to broadband services supplied via cable technology for that price rise to be unprofitable.

2.89 This suggests that the relevant product market should be broadened to include retail broadband services provided using cable as well as ADSL.

2.90 It is also the case that other alternative access technologies could provide similar functionality to ADSL and cable services during the period of the investigation, and in some cases at a similar price (e.g. wireless broadband). This suggests that, given similar availability to consumers, these services were also sufficiently close demand side substitutes for services provided by cable and ADSL technologies to be included in the same product market. Ofcom concludes that wireless broadband is included in the relevant downstream product market.

Different categories of services are all included in the downstream market

2.91 Ofcom has considered whether the categories of ‘entry level’, ‘restricted use’, ‘standard’, ‘1Mbit/s plus’ are demand side substitutes (as described in paragraphs 2.81 to 2.86).

2.92 Such substitution need not be direct. It is possible that services at the higher end (1Mbit/s plus) may not have been directly substitutable with services at the lower

58 UK Broadband Navigator offered a wireless broadband service in the Thames Valley region at August 2004 for £18 monthly rental.
end (entry level). However, there may have been a chain of substitution between them. This would occur if there were sufficient substitution between each link in the chain in response to a SSNIP at a higher level in the chain such that the behaviour of suppliers of those services would become linked, even if there were little direct substitution between services at either end of the chain.\(^{59}\)

2.93 Ofcom considers that there were likely to have been sufficient demand side substitution between the ‘1Mbit/s’, ‘standard’, ‘restricted use’, and ‘entry level’ broadband internet access services for these to have been in the same market. The following diagram illustrates the demand side substitution analysis undertaken by Ofcom.

**Figure 2.4: Illustration of demand side substitution analysis for different broadband products groups**

![Diagram illustrating demand side substitution analysis](image)

**Standard and restricted product demand side substitution**

2.94 In this section, Ofcom sets out the evidence for the existence of demand side substitution between standard and restricted product groups. Ofcom finds that demand side substitution applies in both directions.

2.95 There were some minor differences between standard and restricted use services in terms of the range of value added services included (e.g. e-mail addresses, security features and exclusive content), but the most significant difference was the usage limit itself, i.e. restricted use products have constrained download capacity (the download speed is the same). The relevant question for market definition is whether a sufficient number of consumers would have been willing to trade-off less capacity for a lower price.

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\(^{59}\) OFT Guideline 403, *Market Definition*, (see footnote 34) paragraph 3.11.
2.96 On the basis of pricing data in Table 1, Ofcom considers that substantial price savings on offer would have been likely to have enticed some lower-use consumers to switch away from standard services to restricted services. Table 1 shows that the premium for standard services at August 2004 was between £5-10 per month, and this would rise to around £8-13 where there was a 10% SSNIP. Ofcom considers that as a sufficient proportion of customers either do not reach their usage limits, or would be likely to be willing to restrain their usage to benefit from the lower-priced product, such a price rise of 10% would be likely to have been unprofitable, suggesting that the standard and restricted services are demand side substitutes.

2.97 Ofcom has also considered the possibility that customers chose to substitute to standard services in response to a 10% SSNIP in the price of the restricted service. At August 2004, the £5-£10 premium of standard prices above restricted prices falls to £3-£8, once a 10% SSNIP is applied to the restricted product price. In Ofcom’s view it is plausible that customers could have been expected to substitute away from restricted product to standard product use, given the reduction in margin.

**Standard and entry-level product demand side substitution**

2.98 In this section, Ofcom sets out the evidence for the existence of demand side substitution between standard and entry-level product groups. Ofcom demonstrates that demand side substitution works in both directions.

2.99 During the period covered by the investigation, the main difference between standard and entry level products was the download speed. The relevant question for market definition is whether a sufficient number of consumers would have been willing to trade-off less speed for the lower price of the entry level products.

2.100 In relation to the speed-price trade-off, Ofcom has based its analysis on likely consumer behaviour, given the price differences between different speed services, and the survey evidence indicating that speed is a valuable attribute of broadband, with almost nine in 10 noting it as a perceived benefit of broadband over narrowband.

2.101 In relation to lower or mid-speeds of broadband (i.e. between 512kbit/s and 150kbit/s), Ofcom’s view is that in response to a SSNIP for the 512kbit/s service, it is likely that there would have been sufficient substitution to lower speed services (e.g. 256kbit/s) such that the price rise would be unprofitable. This is because the lower prices of the lower speed services were likely to have proved sufficiently attractive to broadband customers for some switching to take place. Over the period of investigation, monthly rental prices for services between 150kbit/s and 300kbit/s were priced between £5 and £12 cheaper than 512kbit/s services (see Table 1). As at August 2004, a SSNIP of 10% would increase this difference to £8-£15. Similarly, Ofcom considers it is reasonable to have expected sufficient substitution on the basis of a SSNIP on 256kbit/s services with substitution towards

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60 Ofcom has also undertaken demand side substitution analysis for other months during the period of the investigation, including at September 2002 and at December 2004 (see footnotes 53 and 54).

61 Ofcom has also considered demand side substitutions between these same products groups at December 2004 product prices. Ofcom analysis found a SSNIP 10% price increase for standard products would not be profitable and hence placed restricted products in the same relevant product market. (Note restricted products were not generally available at September 2002 hence the premia cannot be calculated at that time).
Ofcom considers that a consumer would be willing to sacrifice some speed - but importantly not all the functionality associated with broadband - for the post SSNIP price savings available from taking a lower speed broadband product.

**Standard and 1 Mbit/s plus product demand side substitution**

2.102 In this section, Ofcom sets out the evidence for the existence of demand side substitution between standard and 1Mbit/s plus product groups. Ofcom demonstrates that demand side substitution between standard and 1Mbit/s plus products places 1Mbit/s plus products in the relevant product market.

2.103 In relation to the higher speed services, Ofcom considers a similar pattern of substitution was likely. That is, at the margin there were likely to have been a sufficient number of consumers willing to switch to higher speed services in response to a SSNIP on the standard services (taking August 2004 prices from £25-£28 to £28-£31), as it would significantly reduce the price premium for the higher speed services (currently priced between £30-£38), which would fall from £2-13 to -£1 to £10.

2.104 To summarise, based on the evidence of functionality, pricing and surveys, Ofcom considers that the following broadband products were linked by demand side substitution, such that they are in the same downstream product market:

a) ‘entry level’ and ‘standard’;

b) ‘standard’ and ‘restricted use’; and

c) ‘standard’, and ‘1Mbit/s plus’.

2.105 Accordingly, Ofcom has demonstrated that a chain of substitution exists between entry-level and 1Mbit/s broadband products.

**Narrowband services are not included in the downstream market**

2.106 Whilst Ofcom considers that there was some competitive interaction between entry-level broadband and narrowband, it has concluded that, during the period under investigation:

a) there were relevant functional differences between broadband and narrowband;

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62 Ofcom has also considered demand side substitution between standard and entry-level products at September 2002 prices and December 2004 prices to demonstrate that demand side substitution applies between these product groups across the period of the investigation. Ofcom has calculated post SSNIP product price differences between standard and entry level products for both September 2002 and December 2004 which again suggest demand side substitutability. At September 2002, the typical price difference was £5-£10, or £9-£13 once a SSNIP of 10% was applied to the standard price. For December 2004, the emergence of restricted products for both standard and entry level product groups calls for two estimations to ensure a like-for-like comparison. First, Ofcom compared standard prices over entry level. This indicates a SSNIP adjusted price difference of £10-£12. Secondly, Ofcom obtained a SSNIP-adjusted price difference of £8-£15 by comparing standard (restricted) and entry level (restricted) prices. These additional results (for September 2002 and December 2004) suggest that material price savings from demand side substitution were possible in response to a SSNIP in the standard product price to entry level products across the period of the investigation and that the imposition of a SSNIP would materially increase the extent of such savings: suggesting demand side substitution.
b) survey evidence of customers' willingness to switch in the event of a SSNIP in the price of broadband suggested that such switching would be insufficient to render a SSNIP unprofitable;

c) this was supported by survey evidence that broadband consumers place a high value on superior broadband functionality. In the light of this, the broadly similar pricing of 'entry level' broadband and narrowband suggests that a SSNIP in the price of broadband would be unlikely to result in sufficient switching to narrowband for the latter to impose a sufficient competitive constraint on broadband to make that SSNIP unprofitable, because it would require a significant sacrifice in highly-valued functionality for only a relatively small saving in price; and

d) that throughout the period of investigation, narrowband has not imposed a sufficiently significant competitive constraint on broadband to be considered to be in the same market.

2.107 In assessing this issue, Ofcom has considered whether a chain of substitution can be found between entry-level broadband products and dial-up narrowband internet access services or whether in fact there was a break in the chain of substitution between entry-level broadband and narrowband.

2.108 Ofcom has undertaken analysis that demonstrates that broadband services are distinguished by their functionality, offering a distinctly higher quality service than narrowband. Ofcom considers that relative prices and the value placed by customers on the higher-quality characteristics of broadband compared to narrowband indicates customers were unlikely to switch back to narrowband given the modest price savings available and significant loss in functionality that would result. Additionally, Ofcom finds that customer survey switching results support placing narrowband in a separate market to broadband during the period covered by the investigation.

Demand side substitution

2.109 The relevant SSNIP test question is whether customers would have been willing to switch to narrowband products in response to a price increase by a hypothetical monopolist of broadband services. Ofcom has considered the following evidence to inform the extent of demand side substitution between narrowband and broadband products.

Product characteristics

2.110 Customers are most likely to switch to products which offer equivalent or at least substantially similar functionality at broadly similar prices in response to a small price increase and in this context, evidence on product characteristics is useful to inform the extent of demand side substitution. Whilst both narrowband and broadband services are forms of internet access, there were (and are) important functional differences between them in terms of speed, always-on functionality and simultaneous voice and data (see Table 1).

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63 These characteristics were often highlighted in the marketing of broadband by major ISPs. In August 2004, for example, the top three characteristics of Tiscali’s broadband service, as listed on its website (www.tiscali.co.uk) were “High speed internet access”, “Always-on internet connection” and “Keeps your phone line free”. AOL (www.aol.co.uk) highlighted “High speed internet access” and “Always on and keeps phone line free”. Wanadoo (www.wanadoo.co.uk) listed “Phone and surf at the same time” and “Always-on and instantly online”. BT
2.111 Ofcom notes that the ‘entry level’ (lower-speed, lower priced) broadband services appear to have been designed to appeal to existing narrowband users.\(^64\) This is likely to have contributed to the increased migration of narrowband users to broadband.\(^65\) However, increasing migration does not of itself provide evidence that a SSNIP in the entry level broadband services would be unprofitable (and hence that the narrowband services are sufficiently close substitutes).\(^66\)

2.112 In fact, Ofcom considers that the introduction of ‘entry level’ services is likely to have made consumers less willing to substitute to narrowband products, given that these newer broadband products provide superior quality for minimal additional charge. For example, narrowband monthly rental prices at August 2004 were around £12.50-£16, while for entry level broadband rentals were around £16-£20 with connection charges of £0-£25.

2.113 Survey evidence can be used to inform whether customers who valued different aspects of broadband would be likely to substitute in the face of a SSNIP. Ofcom has treated this evidence with caution, acknowledging that hypothetical questioning tends to overstate actual switching. It may be the case that surveying a respondent raises his or her product awareness and the possibility of switching. In this sense, the survey may overstate the prospect of switching where the customer would not have otherwise voluntarily considered the product and prospects for switching to it. This could bias the results of any SSNIP test in favour of finding a SSNIP unprofitable and therefore bias the market definition analysis to incorrectly include narrowband in the relevant broadband market (see paragraphs 2.130 to 2.134).

2.114 Ofcom’s demand-side analysis comprises two complementary approaches. The first approach considers customer preferences for broadband functionality and considers the extent of likely demand side substitution between entry level broadband and narrowband services in response to a 10% SSNIP in the price of entry-level broadband (see paragraphs 2.115 to 2.122). Ofcom then considers survey evidence on the willingness-to-pay of residential broadband users to assess whether switching from broadband to narrowband service in response to a 10% SSNIP in the price of broadband services would be profitable or not for a hypothetical monopolist (see paragraphs 2.123 to 2.134). In both cases, Ofcom’s analysis indicates narrowband services are in a separate market from broadband services.

**Assessment Based on Broadband Functionality**

2.115 The first element of functionality considered by Ofcom was the simultaneous use of voice and data. Ofcom considers it unlikely that a consumer who valued this...
characteristic of broadband would switch to narrowband. Even taking into account the effect of the SSNIP (say increasing prices to £18-£22), for a narrowband user to achieve simultaneous use of voice and data by renting a second line, would have resulted in significantly higher total charges (based on line rental of £10 per month) than for the broadband service. This suggests that consumers who valued this aspect of the service would be unlikely to substitute due to a SSNIP in broadband, even if the other characteristics of higher speeds and ‘always on’ were not highly valued.

2.116 The number of consumers who valued simultaneous voice and data use is relevant to this consideration. In the February 2003 OfTEL survey of consumers’ use of the internet, consumers were asked to name at least one perceived benefit of broadband compared to their previous narrowband service that was important to them. The ability to use voice and data services simultaneously was cited by 30% of respondents.67

2.117 Second, Ofcom has considered whether consumers who valued the ‘always on’ characteristics (32% in the February 2003 survey) would switch. Ofcom considers demand-side substitution for customers who value ‘always on’ characteristics from entry-level broadband to narrowband services unlikely given the similarity of prices between narrowband and entry level broadband services and hence the small saving available.

2.118 Third, even consumers who valued neither the ‘always on’ nor ‘simultaneous use’ characteristics, but who valued the speed advantages (87% of respondents), would have faced a decision of whether to switch to a service which delivered one-third the speed (or less) for a SSNIP-adjusted saving in the order of £2-£10 per month.68

2.119 Taking together the February 2003 survey results on consumers’ perceived benefits of broadband, and then using that information to interpret post SSNIP margins between dial-up and entry level prices across the period of the investigation, Ofcom analysis suggests a relatively low level of demand-side substitutability away from entry level broadband to narrowband in response to a 10% broadband SSNIP. Accordingly, Ofcom’s demand side analysis based on an assessment of relative functionality suggests that narrowband services are in separate markets.

2.120 In Section 3, Ofcom’s analysis of customer’s perceived benefits of broadband and post-SSNIP price margins identifies demand side substitution existed between:

a) standard and restricted broadband services;

b) standard and entry-level broadband services; and

c) standard and 1Mbit/s plus broadband services.


68 This figure is based on the difference between narrowband prices existing at the time (£12.50-£16) and entry level broadband prices with a SSNIP applied (£18-£22). Similar SSNIP-adjusted savings results hold for both September 2002 (£2-£10) and October 2003 (£2-£10) (note October 2003 price is not shown on Table 1). Ofcom notes that the product price difference fell slightly by December 2004, when the SSNIP adjusted saving was £2-£7. The price difference is estimated by subtracting the lowest narrowband price from the highest entry level broadband price (maximum of price difference), and subtracting the highest narrowband price from the lowest entry level broadband price (minimum of price difference). Ofcom has applied the same methodology to assess post SSNIP price differences for restricted usage broadband products. Comparing restricted SSNIP-adjusted prices over dial-up prices reveals post SSNIP price difference of £4-£8 at August 2004 and £4-£6 at December 2004 (note restricted entry level products not separately identified in Table 1). Ofcom considers it unlikely customers would sacrifice broadband functionality for the savings on offer from switching to a dial-up service.

69 i.e. for price differences observed for September 2002, October 2003, August 2004 and December 2004.
2.121 Ofcom’s analysis placed all four product groups in the same residential retail broadband market based upon on the similarity in functionality (always on, simultaneous voice and data and faster than dial-up speed) across the products, and the observed price margins which suggested a sufficient proportion of consumers would make price/product trade-offs along the price ladder of broadband offerings such that a hypothetical monopolist could not profitably raise the price for any single broadband product group.

2.122 However, Ofcom considers the evidence on consumer preferences for broadband functionality and price differences between entry-level broadband and narrowband prices provides support for a break in the demand-side chain of substitution between narrowband and entry level broadband during the period under investigation, thereby supporting the view that narrowband services do not fall within the relevant product market.

Assessment Based on Willingness to Pay

2.123 In this section, Ofcom has considered survey evidence on the willingness-to-pay of residential broadband users. Again, Ofcom has treated this evidence with caution for the reasons set out at paragraph 2.113 above.

2.124 Ofcom’s survey evidence measured consumers’ reaction to the SSNIP test at an aggregated level for residential consumers. The surveys asked for a response in relation to questions based on hypothetical price increase, i.e. “which of these (list of options) do you think you would do if your current broadband subscription charges were to rise by £2-£3?”

2.125 Information from the August 2003 survey evidence is summarised in Figure 2.5. It suggests that over four out of five (85%) of broadband consumers claimed that they would continue to use a broadband package in response to a hypothetical price increase (67% would continue using the same broadband products while 18% would choose a product of different speed); 10% of consumers claimed that they would substitute away from broadband services and 4% said they did not know what they would do. Including a proportionate allocation of the 4% of customers who said they did not know what they would do suggests that the figure for those who would substitute away from broadband services may be around 11%.

70 The customer survey information relating to residential customers and their willingness to pay for broadband services from August 2003 is available at: www.ofcom.org.uk/static/archive/oftel/publications/research/2003/q14intres1003.pdf.
71 In the August 2003 survey, consumers are asked which method of connecting to the internet they use at home, with broadband defined as “always on, high-speed access, allows you to make voice calls at the same time as using the internet.”
72 If paying less than £34.99, £4-5 if paying over £35.
73 The results pertaining to this subset of residential consumers surveyed (a base of 133) are subject to an error margin of approximately +/- 8.9%.
74 The survey evidence from August 2003 is consistent with results from earlier surveys. In particular, surveys from February 2003 (published May 2003) and May 2003 (published July 2003) also indicated that around 1 in 10 subscribers claimed they would switch from broadband to narrowband services in response to a 10% price increase (February 2003 survey, paragraph 4.10 http://www.ofcom.org.uk/static/archive/oftel/publications/research/2003/q12intr0503.htm#chapterfour, May 2003 survey, paragraph 5.7, http://www.ofcom.org.uk/static/archive/oftel/publications/research/2003/q13intr0703.htm). The results pertaining to these subsets of 250 and 193 residential consumer surveyed (respectively) are subject to an error margin of approximately +/- 6%-7%).
2.126 For the reasons set out at paragraph 2.113 Ofcom considers that a figure of 11% representing consumers switching away from broadband services in response to a hypothetical price increase is likely to be an over-estimation and therefore treats it with caution.

2.127 Ofcom has therefore considered the extent of any lost profit from switching behaviour as this can inform the profitability of a SSNIP. Lost profit in this sense includes the marginal costs of provision saved from not providing the service to those customers who switch and is assessed through calculation of the ‘critical loss’. This is the percentage reduction in demand for which the SSNIP leaves profits unaffected. So a loss of demand which is greater than the critical loss makes the SSNIP unprofitable, suggesting the market should be expanded to include the substitute service.

2.128 To determine the critical loss, Ofcom has first determined the marginal costs of provision saved from not providing a broadband service to customers who switch. In the context of an investigation into the profitability of retail services using IPStream as an input, Ofcom considers it is appropriate to derive the relevant marginal costs for the hypothetical monopolist based on the IPStream charge plus any retail marginal costs (i.e. based on an assumption that the hypothetical monopolist is vertically separated).

2.129 To maintain consistency with Ofcom’s survey data, the critical loss has been assessed for the average price of ‘standard’ broadband products and assuming that the IPStream charge is the relevant marginal cost. Ofcom recognises that, in reality, this will be below the actual marginal cost as it ignores any other retail costs (e.g. of internet connectivity or customer acquisition) meaning that the estimation of the critical loss is biased downwards. The critical loss value is therefore conservatively estimated to be 20%, based on the marginal cost being approximately 60% of the retail price of £25 (an indicative price for ‘standard’ broadband services). Ofcom has calculated this critical loss value according to the methodology set out in Annex 1.

2.130 The survey evidence suggests that less than 11% of broadband users would cease to use broadband given a 10% price increase. This suggests that actual switching is likely to be well below the figure which Ofcom estimates is the lower bound of the critical loss range. Therefore, this calculation of the SSNIP test relating to residential

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75 Including the use of BT Central. Further references to IPStream in this section are references to a product combining the services set out at (b) and (c) of paragraph 2.51 above.

76 As at August 2004, this charge for Standard BT IPStream 500 was £15.27 per month (inc. VAT). Capacity-based charges for IPStream also exist, but for simplicity Ofcom uses the Standard charging base.
 broadband customers suggests that a SSNIP was likely to be profitable. This suggests that it is likely that, during the period covered by the investigation, there was a separate market for broadband internet access services.\footnote{The survey evidence relates to substitution between broadband services of different speeds, as well as substitution between broadband and narrowband. In relation to broadband services there is a clear gap between the switching proportion (11%) and the critical loss (20%). In relation to different broadband speeds the switching proportion is 19% (derived as 18%, plus a 1% proportionate allocation of the 4% of “don’t know” respondents), which is only just below the critical loss. Ofcom considers that the survey evidence is not sufficiently clear-cut to over-turn the implication of the analysis that broadband services of different speeds should be defined as part of the same market. Ofcom also notes that defining a broader market across different broadband speeds is the more conservative approach.}

2.131 BT argued that the customer survey data used to inform Ofcom’s market definition analysis and findings in this investigation is inadequate. BT restates a number of arguments that it put to Ofcom during the 2004 market review consultation\footnote{BT’s response to Ofcom’s first and second WBA Market Review consultations, April and December 2003 (“BT’s Response to WBA-MR consultation, February 2004”). This response included external reports including (a) Comments on Ofcom’s Explanatory Statement and Notification in respect of the Wholesale Broadband Access Market (Dr Ian Dobbs), (b) Response to Ofcom’s Explanatory Statement And Notification In Respect Of The Wholesale Broadband Access Market (Millward Brown Associates), (c) Wholesale Broadband Access Market Response to the Explanatory Statement and Notification (Professor Martin Collins) and (d) Advertising And Price Elasticities Of ADSL Access (Professor John Nankervis).} to which Ofcom responded in the WBA Market Review.\footnote{Ofcom’s WBA Market Review, May 2004, paragraphs 2.37 – 2.61.}

2.132 As set out at paragraph 2.113, Ofcom recognises that survey evidence must be interpreted with care. For instance, when considering the customer’s propensity to switch in response to a SSNIP, Ofcom recognised explicitly that the survey respondent was asked a hypothetical question as to whether they would switch in response to a 10% increase in the price of broadband. In particular, customers responding to hypothetical questions tend to overestimate the extent to which they will take action (e.g. switching away in response to a price increase). Ofcom therefore accounts for this bias by treating switching estimates arising from a SSNIP as a maximum level of level of switching.

2.133 By making this assumption, and the assumption on marginal cost for the estimation of the critical loss (see paragraph 2.129 above) the maximum possible demand response to the SSNIP test is estimated. Accordingly, Ofcom’s approach is biased toward a finding that narrowband is in the broadband market. The actual result that the demand response of substitution away from broadband to narrowband is insufficient to constrain broadband and that the markets are therefore separate should be seen as clear evidence that narrowband is a separate market to broadband.

2.134 In summary, Ofcom considers on the basis of the analysis and evidence discussed above that narrowband services do not fall within the relevant market. Broadband services are distinguished by their functionality, offering a distinctly higher quality service than narrowband. The evidence on relative prices and the value placed by customers on the higher-quality characteristics of broadband compared to narrowband indicates customers are unlikely to switch back to narrowband given the modest price savings available and significant loss in functionality that would result. Additionally, Ofcom finds that customer survey switching results and hypothetical monopolist test support placing narrowband in a separate market to broadband, during the period covered by the investigation.
Supply side substitution

2.135 The possibility of supply-side substitution also does not support broadening the market definition to include narrowband.

2.136 Using the SSNIP test, the relevant question is whether additional or new suppliers, who are not currently supplying broadband services (but supplying narrowband), will enter the supply of broadband within one year and without incurring significant cost, and whether a sufficient number of customers will switch to those new suppliers to make that SSNIP unprofitable. That is, in order for supply-side substitution to impose an additional competitive constraint on the existing suppliers beyond demand-side substitution, there must be rapid and low-cost new entry from narrowband suppliers which did not supply broadband services previously.

2.137 During the period of investigation, the largest ADSL ISPs supplying narrowband services (BT, ntl, AOL, Wanadoo and Tiscali) were also the largest ADSL suppliers of broadband services. Collectively, these four operators (all present in the broadband market from June 2002) represented over 60% of the narrowband market and 74% of the ADSL broadband market as at December 2003 (collectively the four operators represented an average of over 70% of the broadband market over the period of investigation). If Ofcom were to include cable operators ntl and Telewest (present in the broadband market from June 2002) into the calculation, the shares of the six largest ISPs including cable would represent almost 80% of the narrowband market and 86% of the broadband market as at December 2003. Consequently, supply-side substitution by the major suppliers of narrowband internet services would not impose an additional constraint on broadband prices, since the competitive effect of this entry has already been taken into account by the demand-side analysis.

2.138 A number of smaller ISPs also supplied narrowband and broadband over the period of the investigation. For example, Pipex (which acquired the ISP Nildram during the period of the investigation) and Plusnet together supplied 9% of the ADSL broadband market (6% of the market including cable) as at December 2003. Again, the effect of these operators is already taken into account in the demand-side analysis.

2.139 While it is possible that smaller narrowband ISPs which did not provide broadband services over the period of the investigation could enter the market within a year, these suppliers would be very small ISPs who would be unlikely to achieve a significant market share. Furthermore, Ofcom considers that the scale of customer acquisition costs (particularly marketing and connection fee costs) would mean that any such entry from narrowband suppliers would not be at low cost. On this basis, Ofcom believes that the conditions for supply-side substitution from suppliers of narrowband services to provide a material competitive constraint on broadband suppliers are not satisfied, and so the market definition should not be broadened.

2.140 There is a further issue arising in relation to the possibility of supply-side substitution in the current circumstances. Where a vertically-integrated firm would be dominant in the relevant upstream market but for the inclusion of a constraint arising from the possibility of supply-side substitution, and the ‘would be dominant’ upstream firm was engaged in a margin squeeze, new entry might be deterred or otherwise not effective in constraining the firm. In this case, it could be wrong to broaden the market to include potential competitors, and in so doing conclude that the firm was not

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81 Ofcom’s evidence in relation to BT, as a representative ‘mass market’ player, is that these are at least £150-£200 per subscriber. This is recovered over time by a positive service margin of monthly revenues and monthly servicing costs.
dominant (and thus that there could be no abuse under Chapter II and/or Article 102 TFEU).

2.141 This suggests that consideration of supply-side substitution without proper regard to its likely effectiveness could lead to a false conclusion on market definition where the vertically-integrated firm is dominant in the upstream market and conducting a margin squeeze.\(^{82}\) Ofcom has, however, not relied on this observation, since it is unnecessary for it to do so in light of its conclusion that, in any event, consideration of possible supply-side substitution does not support a broader market definition including narrowband internet access services.

**Conclusion on narrowband and broadband**

2.142 In conclusion, for the reasons set out above, Ofcom considers that neither demand-side or supply-side substitution is sufficient to warrant the broadening of the product market definition to include narrowband internet access services. Hence, Ofcom concludes that broadband internet access services and narrowband internet access services are supplied in separate markets.

*‘Business’*\(^{83}\) *services are not included in the downstream market*

2.143 Since the services under examination in this investigation were aimed at residential customers, the relevant question is whether a SSNIP in services aimed at residential users would have resulted in substitution away from these services towards services aimed at ‘business’ customers.

2.144 During the period of investigation, there were differences in the services aimed at business and residential users which related primarily to speed, contention ratios\(^{84}\) and quality of service (for example greater availability of fault repair services).\(^{85}\) These differences imply that suppliers considered that business users and residential users had different requirements for broadband internet access services.

2.145 Amongst business users, Ofcom considers that there was a distinction between small office/home office ("SoHo") users and other business users. This is because the requirements of SoHo users were often very similar to residential users. The evidence available to Ofcom suggests that services offered to SoHo users were broadly similar to the services offered to residential users, although services offered to residential users tended to be more expensive, higher performance and

\(^{82}\) The CAT accepted the OFT’s argument to this effect in *Genzyme*. [367] “On the supply side, although there are in theory various potential suppliers of homecare services to Gaucher patients, in our [the CAT’s] view the relevant downstream product is the integrated package of Homecare Services which we have already described in paragraphs 344 to 354 above. In practice no homecare services supplier will be able to supply that integrated package of Homecare Services to Gaucher patients unless they are able to obtain Cerezyme from Genzyme on economically viable terms (paragraphs 359 to 363 above).”

\(^{83}\) Note that here, the ‘business’ market does not include small office/home office customers, which are regarded as part of the ‘residential’ market.

\(^{84}\) Typically, business users may be guaranteed better contention ratios i.e. fewer other customers sharing the same bandwidth.

\(^{85}\) For example, at August 2004, BT offered a number of different products targeted at business customers using both single and networked computers. The cheapest BT Business Broadband product was priced at £29.99 per month plus £150 in equipment charges, compared to BT Broadband priced at £24.99 with no upfront charges. The cheapest business product offered data backup, internet hosting facilities and a 24-hour support line. BT’s products for businesses with a number of networked computers started at £45 per month rental (BT Business Broadband Share 500).
of higher specification.\footnote{For example, at August 2004, Tiscali offered a business product at 512kbit/s for £27.99 per month plus connection charges, including a domain name, webspace and e-mail addresses. At August 2004, Bulldog offered a £30 per month product, plus connection charges, but significant lower contention ratio (20:1). These additional features were not offered in the basic services these firms offered to residential users. In addition, packages on offer to high-end residential customers could provide some of the services mentioned above. For example, as at October 2004, Pipex offered Xtreme solo 500, a residential 512kbit/s packages, with a contention ratio of 50:1, e-mail address and webspace for £23.44.} On that basis, Ofcom considers that SoHo users were less likely than larger business customers such as large SMEs (small and medium enterprises) to possess significantly distinct demand side characteristic requirements when compared to residential broadband customers. In addition, there appears to have been no price discrimination by customer type (i.e. there were no barriers to a residential customer purchasing a service designed for SoHo users or vice versa), and some evidence to suggest that SoHo users were buying residential services,\footnote{For example, Oftel survey (August 2003) of SMEs indicated that “[t]hree-quarters of broadband SMEs claim to connect via [A]DSL and a quarter by cable modem. Some businesses claiming to use cable modem do not use a cable supplier, so cable modem use may be slightly overstated. Oftel's subscriber estimates suggest that most cable modem connections are residential packages, so some of these businesses may be using residential packages.” \textit{Business use of Internet, Oftel small and medium business survey, Q13 May 2003 – 31 July 2003} \url{http://www.ofcom.org.uk/static/archive/oftel/publications/research/2003/q13imb0703.htm#chapterthree}.} which suggests that there may have been a common pricing constraint. Ofcom therefore considers that the services supplied to residential and SoHo customers are likely to be in the same market.

2.146 Ofcom considers there was a clear distinction between residential and SoHo users on one hand, and business customers on the other.\footnote{For clarity, in the remainder of the analysis of market definition the term ‘residential’ should be taken also to include SoHo users unless otherwise indicated.} The differences in demand characteristics (as perceived by suppliers) between these categories of user were reflected in the services available and reflected the likely differences in their needs. For example:

a) business customers were likely to require more bandwidth and lower contention levels and more advanced networking facilities than residential customers, as such businesses tended to have a number of employees sharing their internet access;

b) business customers also tended to have a lower tolerance of delays than residential customers;

c) some businesses were also likely to have a greater need for upload capacity, i.e. greater bandwidth in the return path, if they wished, for example, to make available information and provide customer services on websites;

d) business customers also tended to require a more tailored level of customer support and a higher level of network reliability from their internet access suppliers; and

e) residential users were likely to tolerate higher contention rates, had lower bandwidth demands, especially for uploading and generally had less exacting demands than business users in relation to their broadband service.

2.147 Ofcom considers that a hypothetical monopolist of the broadband services aimed at residential users would have found it profitable to sustain prices above competitive levels, because these users would not have switched in sufficient numbers to broadband services aimed at business users due to the higher prices (they tend to be significantly more expensive – see footnote 86). This suggests that the services
aimed at residential and business users were, in the relevant time period, in separate markets. To an extent, residential customers could move to receive higher bandwidths, lower contention ratios and higher quality of service, but residential customers were unlikely to value these characteristics sufficiently highly to induce them to switch to business services (which were materially more expensive even than premium residential services). Ofcom therefore considers that there was a break in the chain of substitution between business and residential services; that is, between services with lower contention ratios, business networking facilities and other features aimed at business users, and services with higher contention ratios designed for use on single computers or home networks aimed at residential users.

2.148 On the supply side, the relevant question is whether supply side substitution from suppliers of business services would constrain the ability of a hypothetical monopolist of residential services to impose a SSNIP. Most ISPs appear to have supplied both business and residential customers during the period of the investigation. Because there would not be additional capacity/supply constraints, Ofcom does not consider that the then existing suppliers of business services should be included in the consideration of supply side substitution. This means that the five largest ISPs supplying business services are not considered as being supply side substituters into residential services. In addition, at a retail level, there were likely to be significant costs for a retail provider of business internet access to move into the provision of residential internet access, such as the need to extensively market to establish a brand attractive to residential customers and acquire customers. Consequently, Ofcom finds that there was only very limited supply side substitutability between suppliers of services aimed at business and residential users, and insufficient to justify broadening the market definition.

Symmetric services are not included in the downstream market

2.149 Symmetric broadband internet access services have the same upload and download speeds. Such services are desired by customers who have higher upload requirements (e.g. if the customer is a business with a website which is frequently accessed). During the period of investigation, symmetric broadband internet access often involved the supply of broadband services over partial private circuits or leased lines (that is, high bandwidth dedicated connections designed to support high bandwidth services and that are typically much more expensive than residential services), whereas asymmetric internet access was provided using predominantly ADSL and cable technologies (that is, lines configured to offer voice telephony and other services used by residential customers).

2.150 Using the SSNIP test, the relevant question is whether a 10% rise in the price of asymmetric broadband services supplied to residential users would have caused sufficient substitution to symmetric broadband services for that price rise to have been unprofitable. The evidence of the willingness-to-pay of users is limited, but on the basis of the significantly different costs involved (and hence competitive

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89 Ofcom notes that in the WBA Market Review 13 May 2004, and in its latest review of the WBA Market, the conclusions of which are set out in the statement published 21 May 2008, it found that, looking forward, these services were likely to be characterised by a chain of substitution, such that they could be considered to be supplied in the same market. However Ofcom does not believe that a sufficiently strong chain of substitution existed in the period under investigation from residential to business services to conclude that business services exert a significant competitive constraint on residential services in the present case.

90 Ofcom’s residential/SME research indicates that Demon Internet was the only significant (>5% of market share) supplier of ‘business’ services that did not also have a significant market share for residential / SoHo users, although it did supply services to these users.
prices), the prices available for symmetric services and the low valuation that most consumers place on symmetric access, Ofcom considers that substitution is likely to have been very limited, implying that symmetric broadband access services are not provided in the same market as asymmetric broadband services during the period covered by the investigation.

Mobile internet access services are not included in the downstream market

2.151 Ofcom considers that, during the period of the investigation, mobile internet access did not impose sufficient competitive constraint on fixed broadband internet access to be included in the relevant product market.

2.152 Internet access over mobile networks was not an effective demand side substitute for broadband internet access on fixed networks. During the period under investigation, internet access on a mobile phone offered considerably less functionality than a fixed broadband network. For example, only a fraction of the internet was accessible over a mobile telephone and only part of this fraction was deliverable because of the constraints of screen size on mobile telephones. Furthermore, interactivity was constrained because of the lack of a full-size keyboard. The evidence does not therefore suggest that, during the period of investigation, such substitution was, in fact, a relevant constraint to a material extent.

Conclusion on downstream product market

2.153 Ofcom concludes that the relevant downstream market is that for asymmetric residential broadband internet access services.

Geographic market

2.154 The application of the SSNIP test, in line with the approach to product market definition, is also relevant for defining the geographic market: the question is whether a hypothetical monopolist in one area would have been constrained by consumers switching to other suppliers in other areas, or by other suppliers switching to the area in which the hypothetical monopolist supplies.

2.155 In the circumstances of this case, however, this approach does not appear particularly informative. On the demand side, consumers are highly unlikely to switch area (e.g. to move home or relocate a business) in order to change internet supplier. On the supply side, virtually all (non-cable) ISPs delivered retail services on a national basis, which implies that a price increase in one area would not result in new entry from ISPs that did not currently serve that area but only supplied other areas. For cable operators to enter another area using their own network would take time and require them to incur significant cost, so they are not a source of supply side substitution either.

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91 BT introduced symmetric IPStream and DataStream services, but the rental charges for these services exceeded £100 per month, far in excess of retail prices for asymmetric services.

92 A customer survey conducted for Oftel in October 2002 suggests that many UK (residential) broadband customers of internet access did not value the additional functionality of a symmetric service. Only 23% of residential broadband customers said that they would pay any additional charges to obtain a symmetric service with double their upload speed. (This result is not the same as suggesting 23% of customers would switch to symmetric broadband in response to a 10% price increase in the price of asymmetric broadband services. Here, the 23% of customers may or may not be willing to pay 10% more to have the symmetric broadband service; still less it is clear that they would be prepared to pay the very significant price differential that exits between symmetric and non-symmetric services).
Indeed, in the period covered by the investigation, BT, cable operators and other ISPs chose to offer services at prices that were the same across all the areas that they served i.e. on a ‘geographically-averaged’ basis (although noting that cable companies were limited to the geographic reach of their networks). A strategy of offering geographically averaged prices affects an ISP’s decisions to then set or change retail prices, since price changes are offered to all customers, not merely those in a single area. There are important reasons which would deter ISPs from charging different prices in different areas, including transaction costs, difficulties for marketing and possible adverse customer perceptions of fairness. The fact that geographically averaged pricing was the norm demonstrates the weight of these factors.

Hence, given that suppliers did not vary retail prices geographically, in general it could be expected that suppliers would have taken account of the average national competitive conditions i.e. there is a national common pricing constraint. Therefore, this pricing data (operators offering services on a single national price) indicates that the appropriate downstream geographic market definition during the period of the investigation is a national market.

Conclusion on the relevant downstream market

Ofcom has concluded that, for the reasons set out above, the downstream market is the market for residential asymmetric broadband internet access services in the UK.

The upstream market

Introduction

The provision of retail broadband services involves activity at a number of distinct functional levels as follows:

a) the provision of access to a local access network, such as BT’s customer access network. Such access can be provided in a number of different ways:

- as a discrete service by which BT offers regulated access to third parties in the form of unbundled local loops. Third parties who purchase services may then enable those lines for broadband and compete with BT in the provision of retail services;

- as part of a bundled wholesale broadband service for third parties in combination with other wholesale elements; or

- through self-provision by BT or others (principally cable operators) of access for the purposes of providing their own retail broadband services);

b) the provision of ‘wholesale broadband access’: that is ‘transmission capacity’ from the premises of an end user across a broadband network to a point of interconnection with another network operator. An example of a wholesale broadband access service is BT’s DataStream service, which enables interconnection to the transmission layer of BT’s own broadband network. Wholesale broadband access services are not suitable to be used, unmodified,

Non-BT cable operators in both the wholesale intermediate and retail residential broadband services markets could use DataStream and IPStream to serve customers outside their franchise regions.
by an ISP (i.e. a provider of retail broadband access). The type of modification needed can vary significantly, but could include the addition of aggregation or switching devices and/or the addition to network conveyance;

c) the provision of ‘wholesale intermediate services’ services, which provide an internet protocol (“IP”) based connection from an end-user’s premises to the premises of an ISP. These services allow end-users to connect via the ISP’s facilities to the internet. These services may be:

- purchased directly, as in the case when an ISP purchases IPStream from BT; or
- self-provided, when the ISP has access to one of the upstream levels; and
- the provision by ISPs of retail services to end users.

2.160 For the reasons set out below, Ofcom considers that it is appropriate to define the separate vertical layers of the broadband supply chain in this way during the period covered by the investigation. In particular, Ofcom considers that the demand by ISPs for broadband services that would enable them to purchase ‘end-to-end’ services suitable for straightforward resale (such as IPStream (including BT Central)) gave rise to a distinct vertical layer which Ofcom has defined as ‘wholesale intermediate services’.

2.161 Ofcom considers services based on interconnection at the transmission layer of the network (such as DataStream) to be higher up the vertical chain because they are not suitable, without significant modification, to be used as an ‘end-to-end’ input for an ISP seeking to acquire retail customers. Conversely, the purchase of an IPStream type service cannot deliver to an ISP the same range of functionality available to a supplier who is willing to take on the additional control over the mechanism of delivery of service permitted by, say, DataStream.  

2.162 Each of the three levels outlined at paragraph 2.159(a) could be described as ‘wholesale’ services, in the sense that they are not supplied to retail users but are instead purchased by other network providers or ISPs. The relevant level for this investigation is at paragraph 2.159(b), where services such as IPStream which provides a bundle of origination, conveyance and other services are supplied to ISPs. To avoid confusion over terminology, Ofcom refers to these services in this investigation as ‘wholesale intermediate services’.

2.163 The complaint in this case alleges that BT had engaged in a margin squeeze between BT’s wholesale intermediate service (IPStream) and BT’s retail services. It does not involve any allegation of margin squeeze between other functional levels of the market and Ofcom’s analysis in this case has not considered any questions relating to these other levels of activity except to the extent that it is relevant to the assessment of the complaint. The analysis of the complaint therefore requires defining the relevant upstream market (i.e. the market in which BT supplies the wholesale intermediate service (that is, IPStream)) in order to make an assessment of whether BT is dominant in this market.

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94 In principle, DataStream offers a significantly greater ability to control how services are dimensioned in terms of contention. It also offers the ability to vary the quality of service parameters so that the wholesale service can be used to support different end user applications. Tiscali is an example of an ISP that moved ‘up’ the value chain by purchasing DataStream and undertaking management of the IP network to produce a more varied set of services for retail customers.
2.164 Ofcom considers the starting point for assessing the upstream product market definition is to consider the direct constraints that were on BT in offering IPStream. This approach identifies whether a SSNIP on the wholesale intermediate services product IPStream would be rendered unprofitable by either demand or supply side substitution at the same level in the supply chain. However, substitution is also possible at the retail level and may provide an indirect constraint on BT’s pricing of IPStream. By not considering indirect constraints through substitution in the downstream market this starting point necessarily provides the narrowest possible definition of the market.

2.165 Consideration only of direct constraints could lead to Ofcom overstating BT’s market power in its assessment in Section 3. Accordingly, Ofcom has taken into account the effect of indirect substitution through applying the SSNIP as if it would be passed through to the retail market. This means that, for example, a 10% price increase for the ADSL wholesale intermediate service would translate into a price increase (but of less than 10%) for the ADSL-based broadband internet access product at the retail level. This retail price increase would be less than 10% because the wholesale element is only part of the initial retail price. In this case, as the price of IPStream was during the period of the investigation approximately 60% of the retail broadband price, the dilution factor is 60%. A 10% increase in the IPStream price would then be expected to lead to 6% increase in the retail price. Therefore the impact of the upstream SSNIP is diluted in the retail market and therefore is muted (relative to the strength of a 10% SSNIP at the retail level) in its constraining effect on BT’s pricing of IPStream in the upstream market.\(^95\)

2.166 Indirect constraints are important in this case because, as discussed below, there was little direct competition to BT at the wholesale level. In theory, indirect constraints could be taken into account at either the market definition stage or at the market power assessment stage. In the former case the defined market would include services that are not directly substitutable at the wholesale level. In the latter case market power would be constrained in practice by services outside of the defined market. In principle it should not matter to the overall market assessment which of these approaches is taken, provided the presence of indirect constraints is correctly reflected in the analysis. However, in this investigation Ofcom believes that it is appropriate to include sources of indirect constraints at the market definition stage and then analyse the strength of those indirect constraints on BT in the dominance assessment stage. The main reasons for this include:

a) The indirect constraint which cable operators exert at the wholesale level results from potential substitution by retail customers. This is a demand side effect. Whilst it is often argued that it is possible to take account of supply side constraints either at the market definition stage (as supply side substitution) or in the assessment of market power (as potential entry), the constraining effect of cable operators does not depend on any perceived threat of entry to the wholesale market; and

b) If indirect constraints were included only in the assessment of dominance, they would not be reflected in the calculation of market shares. Given the importance given to market share in the analysis of dominance, there would be a danger of overstating market power if sources of indirect constraints were not included in the relevant market.

\(^95\) Ofcom notes that self-supplied DataStream volumes are included in total market volumes, but are not attributed to BT’s shares of either direct or indirect constraints.
2.167 Ofcom’s strong preference in this particular case is to include the consideration of indirect constraints in the market definition stage. Given the importance given to market share in the analysis of dominance, and given the high level of BT’s share of wholesale intermediate broadband access services sold to third-parties, Ofcom considers that to exclude the constraint imposed by cable at the market definition stage risks, in effect, prejudging the assessment of dominance. Hence for the purposes of market definition, Ofcom takes the approach of defining a broader market including both ADSL-based and cable-based wholesale broadband access services, leaving the assessment of the strength of competitive pressure from indirect constraints (and direct constraints) to the assessment of dominance.

2.168 Accordingly, Ofcom’s approach takes into account the effect of indirect substitution at the market definition stage, through applying the SSNIP as if it were passed through to the retail market.

Product market

Narrowband wholesale intermediate services are not included in the upstream market

2.169 Broadband internet access services cannot be supplied using a narrowband wholesale intermediate service input. Focusing solely on direct substitution in this way suggests the exclusion of narrowband wholesale intermediate services from the relevant upstream market definition. However, in order to ensure that it does not overlook relevant competitive constraints, Ofcom has also considered whether substitution at the retail level could have indirectly provided a constraint on the hypothetical monopolist of broadband wholesale intermediate services.

2.170 This question is informed by the downstream market definition. As set out above, Ofcom’s conclusion is that narrowband internet access services are not supplied in the same market as broadband internet access services during the period of the investigation. Consequently, indirect substitution at the retail level was unlikely to have provided an effective constraint.

2.171 To illustrate this further, it can be seen that retail prices can be regarded as being comprised of a number of input costs and one of these input costs is the cost of a wholesale intermediate service. If the charge for this wholesale service was to increase, and all other elements of the retail service were priced at the competitive level, this would translate into a price increase at the retail level.

2.172 This means that, as described in paragraph 2.165, a 10% price increase for the ADSL wholesale intermediate service would translate into a price increase (but of less than 10%) for the ADSL-based broadband internet access product at the retail level. This retail price increase would be less than 10% because the wholesale element is only part of the initial retail price. The impact of a 10% SSNIP at the wholesale intermediate service level would lead to an approximate 6% increase in the retail price (as Ofcom estimates the wholesale input makes up around 60% of the retail price – see further Annex 2).

2.173 As set out above, Ofcom found that only around one in 10 consumers would switch away from broadband at the retail level in response to a 10% price increase, and this was not considered to provide sufficient response to prevent the SSNIP being profitable. Consequently, a smaller price rise at the retail level (which would reduce the one in 10 figure) would be likely to lead to less substitution, and therefore less chance of the SSNIP at the wholesale intermediate service level being unprofitable.
Assuming for simplicity a linear relationship between price increases and switching behaviour, the survey evidence suggests a 6% retail price increase (following a 10% wholesale price increase) would lead to around 6% of consumers switching at the retail (and therefore wholesale) level. This means that a SSNIP on the wholesale intermediate service price is likely to be profitable because it leads to a loss of customers lower than that which would render the price rise unprofitable (i.e. a switch of 6% compared with the lowest possible (i.e. assuming zero marginal cost) critical loss of 9.1%). This provides further support for the conclusion of separate wholesale intermediate broadband and narrowband markets.

2.174 The possibility of supply side substitution also does not support broadening the market definition to include narrowband. Using the SSNIP test, the relevant question is whether additional or new suppliers, who are not currently supplying wholesale broadband services (but are supplying narrowband), would enter the supply of wholesale broadband within one year and without incurring significant cost. That is, in order for supply side substitution to impose an additional competitive constraint on the existing suppliers beyond demand side substitution, there must be rapid and low-cost new entry from narrowband suppliers which did not supply wholesale broadband services previously.

2.175 Ofcom does not believe such entry to have been likely. This is because, in order to begin supplying wholesale broadband intermediate services, a supplier of narrowband services would have had either to build its own access network or to purchase a further upstream input from BT, that is, LLU or Datastream. In order to use DataStream, the supplier needs to have its own core network, which requires sunk investment in infrastructure, whilst the sunk investments needed to enter as an LLU operator or by building an access network are even greater. In addition, Ofcom notes that during the period under investigation, the largest suppliers of wholesale broadband intermediate services (BT, the cable operators and the largest Datastream user, Tiscali) were among the largest suppliers of narrowband services. Consequently, even if rapid low-cost entry were possible, supply side substitution by the major suppliers of narrowband internet services would not have imposed an additional constraint on broadband prices, since the competitive effect of this entry has already been taken into account by the demand side analysis.

2.176 On this basis, Ofcom believes that the conditions for supply side substitution from suppliers of narrowband services to provide a material competitive constraint on wholesale broadband suppliers are not satisfied, and so the market definition should not be broadened to include narrowband services.

Cable-supplied wholesale intermediate services are included in the market

2.177 Cable operators do not generally provide intermediate services to ISPs, but in the course of their retail supply to end-users, intermediate services are self-provided by cable operators. This raises the question of whether supply of intermediate

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96 The critical loss is the percentage reduction in demand for which the SSNIP leaves profits unaffected – a larger loss of demand than the critical loss makes the SSNIP unprofitable. The critical loss is smallest when marginal costs are zero because this means that no costs are saved as a result of the reduction in demand caused by the SSNIP.

97 If marginal costs are assumed to be zero, the critical loss for a 10% SSNIP is 10% / (1 + 10%) = 9.1%. Note this approach is consistent with the methodology used in customer surveys to identify likely switching in response to non-marginal SSNIP increases in the broadband price. See further Annex 1.

98 Ofcom notes that ntl supplied intermediate services to AOL during the period of the investigation. However, only a very small number of consumers were supplied with connections via this deal and therefore Ofcom does not consider that this is enough for cable to have sufficiently constrained ADSL wholesale intermediate services.
services by cable operators could be considered a constraint on the supply of intermediate services over ADSL (in areas where cable was supplied).

2.178 As cable operators do not generally sell to ISPs,99 Ofcom does not consider that direct substitution between wholesale intermediate services would have provided a significant constraint. That is, ISPs that are not cable operators cannot generally substitute a cable-based wholesale intermediate service for an ADSL wholesale intermediate service. The relevant question therefore is whether there would have been an indirect constraint (via the retail market) in response to a SSNIP in ADSL wholesale intermediate services. Again the question is whether a 10% rise in wholesale intermediate service prices, which would lead to around a 6% increase in retail prices, would induce sufficient substitution.

2.179 As indicated in Table 1, retail services provided by cable operators during the period of the investigation were very similar to those supplied over ADSL (in terms of speeds, always on functionality and the ability to use data and voice services simultaneously). This suggests that consumers would react – even to a 5% increase – by substituting away from downstream retail services supplied using ADSL. Such substitution would therefore provide an indirect constraint on the supplier of ADSL wholesale intermediate services. Hence for the purposes of market definition, Ofcom takes the conservative approach of defining a broader market including both ADSL and cable-supplied wholesale intermediate services during the period covered by the investigation, leaving the assessment of the strength of competitive pressure on BT from cable as a further consideration when assessing dominance.

**Wholesale intermediate services using other technologies are included in the upstream market**

2.180 Similar arguments can be applied to other technologies as well as cable i.e. there will have been an indirect constraint via the retail level which means that these services should be considered part of the relevant upstream market. Obviously, given the small size of such operators during the period of investigation, it is questionable whether such operators could have provided a genuine competitive constraint. Ofcom nonetheless includes these operators to provide a conservative market definition.

**Wholesale intermediate services used to supply business services are not included in the upstream market**

2.181 Again, the question of substitutability at the wholesale intermediate service level is informed by an analysis both of direct substitution possibilities and of indirect substitution at the retail level. That is, in considering whether a SSNIP by a hypothetical monopolist of wholesale intermediate services used to supply retail services aimed at residential users would lead to sufficient substitution to ‘business’ wholesale intermediate services, it is necessary to first consider whether direct substitution would have been feasible (technically and commercially), and if it would not, then to consider whether indirect constraints (i.e. substitution by retail users) would have been sufficient to constrain the hypothetical monopolist.

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99 See footnote 90 above.
2.182 As regards direct substitution, BT appears to have been the only supplier of business intermediate services over the period under investigation. The question is therefore whether ISPs could have switched to wholesale intermediate services aimed at business end-users in order to supply services aimed at residential end-users. In relation to BT, such substitution does not appear to have been commercially feasible as the price of ‘Office’ wholesale intermediate services was higher than those for ‘Home’ wholesale intermediate services. This would have limited the ability of ISPs to switch, as even after the SSNIP, ‘Home’ services would still have been less expensive than ‘Office’ services.

2.183 Turning to the question of indirect substitution effects, it was noted in the downstream market definition that services supplied to residential users and business users were, in the relevant period, considered to be in separate markets, because a SSNIP in the retail prices of residential packages would have been unlikely to have induced sufficient switching to business packages to render it unprofitable. This in turn suggests that a 10% SSNIP in wholesale intermediate services would also have been profitable. That is, the SSNIP, which as described above would likely increase retail prices by around 6%, would have been unlikely to induce sufficient consumer substitution towards services supplied to business users, and indirectly towards ‘business’ wholesale intermediate services.

2.184 Consequently, Ofcom finds that, due to a lack of direct or indirect substitution, wholesale intermediate services used to provide retail services aimed at residential users are supplied in a separate wholesale market during the period of investigation.

2.185 For supply side substitution to be a relevant constraint, it would have to be the case that there were existing suppliers of wholesale ‘business’ intermediate broadband services who would begin to supply wholesale ‘residential’ intermediate broadband services in response to a SSNIP and who were not already present in the latter market. As at the retail level, there do not appear to have been any significant potential supply side substituters in the relevant period.

### Geographic market

2.186 As stated in the retail geographic market definition, the geographic boundary of the relevant market is generally defined using the concepts of demand and supply side substitution. However, in this particular case, the common pricing constraint that existed during the period under investigation is the more relevant determinant of the geographic market.

2.187 As at the retail level, BT’s charges for its wholesale intermediate services were, for the period covered by this investigation, geographically uniform. Ofcom understands that cable operators and other operators using DataStream or products based on LLU services also set geographically uniform prices at the wholesale or retail level during this period.

2.188 Ofcom is aware that BT’s shares of subscribers in the cable and non-cable areas were substantially different, with BT having a share of supply of less than 50% in

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100 As (during the period of the investigation) cable operator ntl provided services only to AOL, which does not provide services specifically targeting business users.
101 For example, the price of the end-user access component of the service was £21 (as against £15) at August 2004 prices.
102 This was not a regulatory requirement but a policy set commercially by BT.
certain cable areas and near 90% in non-cable areas. This data suggests that there could have been a significant difference in the competitive conditions between the cable and non-cable areas. However, as stated, BT set geographically-averaged prices for wholesale intermediate services during the period under investigation, and it therefore seems likely that, in considering any pricing response to competition in wholesale intermediate services or indirectly to retail competition in a given area, BT would have taken into account the average of competitive conditions across the country. This geographic averaging is indicative of a common pricing constraint and suggests that the geographical extent of the relevant market should be regarded as the whole of the UK.

2.189 Ofcom considers that BT’s decision to change its IPStream price from April 2005 is consistent with the view that between June 2002 and December 2004, there was a national geographic market at the wholesale intermediate services level. It is unclear why BT did not introduce geographically differentiated prices prior to 2005 unless this was because competitive conditions during the period of the investigation were sufficiently homogenous across the UK.

Conclusion on the relevant upstream market

2.190 Ofcom concludes that the relevant upstream market is that for residential wholesale intermediate broadband services within the UK.

Conclusion on relevant markets

2.191 In light of the above, Ofcom concludes that the relevant markets over the period of investigation to be considered in the present case are:

a) The downstream market for residential retail asymmetric broadband internet access services within the United Kingdom; and

b) The upstream market for residential wholesale intermediate broadband services within the United Kingdom.

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103 Ofcom’s WBA Market Review, 13 May 2004, paragraph 3.32. In its most recent review of WBA markets, the conclusions of which were published on 21 May 2008, Ofcom has found that BT no longer has SMP in wholesale broadband access in certain geographic areas. This however reflects the growth in LLU based competition in some areas which has occurred since the period relevant to this investigation.

104 Excluding the Hull area: the area defined as the ‘Licenced Area’ in the Licence granted 30 November 1987 by the Secretary of State under section 7 of the Telecommunications Act 1984 to Kingston upon Hull City Council and Kingston Communications (Hull) plc.
Section 3

Assessment of BT’s position in the relevant markets

Introduction

3.1 As set out above at paragraph 1.16, a pre-requisite for a finding of margin squeeze is that an undertaking is dominant in an upstream market and active on a downstream market. This section sets out Ofcom’s analysis of whether BT held a dominant position within the upstream market for residential wholesale intermediate broadband services within the UK during the period covered by the investigation.

3.2 As is evident from Section 2, BT was active on the downstream market for residential asymmetric broadband internet services throughout the period under investigation, through the provision of the BT Openworld Broadband and BT Broadband products. Accordingly, if BT can be shown to have enjoyed a dominant position on the upstream market, it may be possible for it to operate a margin squeeze.

Assessment of dominance within the residential wholesale intermediate services market

3.3 In its assessment of dominance, Ofcom considers the constraints on an undertaking’s ability to behave independently of competitors and customers. In considering those constraints, Ofcom has looked at the following factors:

a) market shares, market growth and coverage of different suppliers (paragraphs 3.5 to 3.68);

b) barriers to entry and expansion (including discussion of economies of scale and scope) (paragraphs 3.69 to 3.87); and

c) countervailing buyer power (paragraphs 3.88 to 3.97).

3.4 For the reasons set out below, Ofcom has concluded that BT was dominant in the market for residential wholesale intermediate broadband services within the UK over the period from June 2002 to December 2004.

Market shares and growth

3.5 An analysis of dominance often begins with an assessment of the market share of the allegedly dominant company.

3.6 In its guideline, Assessment of Market Power, the OFT states: 105

“There are no market share thresholds for defining dominance under Article 102 or the Chapter II prohibition. An undertaking’s market

105 OFT 2004 competition law guideline, Assessment of Market Power
share is an important factor in assessing dominance but does not
determine on its own whether an undertaking is dominant".  

3.7 The OFT goes on to say that it considers it unlikely that an individual undertaking would be dominant with a market share of below 40% but it acknowledges that, if other factors are present such as the weak position of competitors in that market, dominance could nonetheless be established.

3.8 The approach of the Court of Justice of the European Union ("ECJ") can be illustrated by the following cases:

a) In *Hoffmann-La Roche*,\(^{108}\) the ECJ held as follows:

"...Furthermore although the importance of the market shares may vary from one market to another the view may legitimately be taken that very large market shares are in themselves, and save in exceptional circumstances, evidence of the existence of a dominant position. An undertaking which has a very large market share and holds it for some time... is by virtue of that share in a position of strength."\(^{109}\)

In *Hoffmann-La Roche*, market shares over a three year period of between 75%-87% were found to be so large that "they are in themselves evidence of a dominant position".\(^{110}\)

b) In *AKZO*,\(^{111}\) the ECJ stated that dominance was to be presumed in the absence of contrary evidence if an undertaking has a market share persistently above 50%.

c) In *United Brands*, United Brands had held a market share that had varied between 40% and almost 45%.\(^{112}\) The ECJ held that this was not of itself sufficient to permit the conclusion that the undertaking concerned controlled the market. The ECJ noted however that this percentage was several times greater than its closest competitor and went on to conclude:

"This fact together with the others to which attention has already been drawn may be regarded as a factor which affords evidence of UBC’s preponderant strength."\(^{113}\)

d) In *Virgin/British Airways*,\(^{114}\) the Commission found that British Airways ("BA") was dominant in the UK air travel agency services market with a market share of 39.7%. That BA was dominant was upheld by the General Court on appeal.\(^{115}\)

3.9 The courts’ assessment of the degree of market power held by an undertaking from its market share reflect the conventional relationship between market shares and

\(^{106}\) *Assessment of Market Power*, paragraph 2.11.
\(^{107}\) *Assessment of Market Power*, paragraph 2.12.
\(^{114}\) [2000] 4 CMLR 999.
\(^{115}\) [2003] ECR II-5917. Note that issues of dominance did not form part of a subsequent appeal of the General Court’s decision to the ECJ (judgment 15 March 2007).
market power which is considered to exist when the effect of competing products is felt directly and the market is relatively stable and mature.

3.10 Ofcom’s market definition also takes account of indirect substitutes. Ofcom then analyses the effect of dilution (of wholesale level price changes) on the strength of constraints provided by such substitutes when assessing market power (see paragraphs 2.164 to 2.168).

3.11 As noted at paragraph 2.179, Ofcom considers that the extent of the indirect constraint imposed by cable operators is a question that is more appropriately addressed as part of the assessment of dominance and has chosen not to pre-judge the issue in the market definition. Hence for the purposes of market definition, Ofcom has taken the conservative approach of defining a broader market including both ADSL and cable-supplied wholesale intermediate services, as well as other technologies available at the retail level and other forms of self-supply, including the use of further upstream inputs (DataStream and LLU). This has an important bearing on the use of market share data in the following section.

3.12 An additional feature of this market that acts to alter the conventional relationship between market shares and market power is that Ofcom considers that, for at least part of the period of investigation, the market exhibited some of the characteristics of an immature market and a fast rate of growth. Under these circumstances traditional market share measures are generally a less reliable indicator of market power than in more mature markets.

a) In immature markets, the market will often initially be relatively small in size compared to the future size of the market. Market shares in the early stages may reflect the relative positions of suppliers in relation only to a small proportion of customers compared to the numbers of customers in later periods, and may consequently be less stable. Inferring market power from market shares when a market is establishing itself could be misleading if, over time, firms’ shares of the growing market diverge from that observed at the beginning of the period when sales are few (relative to future sales).

b) Observed market shares in immature markets may reflect transitory factors which represent a less meaningful indicator of market power. For instance, initial conditions (e.g. shares at market opening) can reflect short term or transitory factors that have the potential to be reversed rapidly through the response of firms to growth in the market. The longer the period in which the market has been established, the more likely it is that transitional factors that have influence over market share outcomes will unwind, so it can be expected that the effect of such factors will diminish over time.

3.13 However, whilst care must be taken in placing reliance of market shares, this does not mean that undertakings cannot possess market power in immature markets. Whilst market power is often inferred from market shares that are persistently high, persistence in market shares is a symptom of market power rather than a necessary condition for it. Even in an immature market an undertaking may be just as able to act independently of its competitors and customers as in a mature one.

3.14 For these reasons, Ofcom considers that the earlier in the market's lifetime that it is observed, the more interpretation issues arise in respect of inferring market power from conventional market share measures. This suggests care needs to be taken in interpreting the market shares in this case, especially those at the beginning of the period of investigation. Ofcom considers that traditional market share measures
(e.g. imputed by retail volume shares) at that point in time understate BT’s market power relative to its underlying market position. It is important, therefore, also to consider measures that reflect the sources of market power, and in particular BT’s coverage advantage, when making assessments of market power. This provides a more accurate picture as to whether BT had the ability to act independently of other competitors and customers.

3.15 The implications of these key features of the retail and wholesale residential intermediate broadband services markets for assessing dominance are set out below.

Direct and indirect constraints

3.16 The following section identifies in more detail why conventional market share measures may over or understate BT’s market power in this particular market.

Direct constraints

3.17 In Section 2, Ofcom considered the nature of direct and indirect constraints relevant to the market definition stage. Ofcom concluded that, while it is possible to take account of indirect constraints at the market definition or market power stages of the analysis, it was preferable to do so at the market definition stage. Accordingly, this section will consider market power in a market defined by reference to the combined effect of direct and indirect constraints.

3.18 However, before considering the more complicated analysis of the operation of the indirect constraints, it is worth setting out the simpler analysis of the market based on direct constraints only (i.e. excluding cable operators).

3.19 Under this approach, BT’s market power in the residential wholesale intermediate services market is derived from its market share of directly substitutable products (i.e. on the basis of direct constraints only). The relevant substitution possibilities are those available to ISPs who buy wholesale intermediate services and market shares are assessed in terms of volumes sold to them. In practice BT faces limited direct constraints on its pricing of IPStream because it does not compete head-to-head with cable or other ‘equivalent’ products at the wholesale intermediate services level of the supply chain. Subject to paragraph 3.20, this means that BT is without significant ‘horizontal’ competition at this point in the supply chain. Accordingly, BT’s share under this method is (close to) 100%.

3.20 BT did face some very limited horizontal competition at the wholesale intermediate services level of the supply chain in the following ways, thereby reducing BT’s market share based on direct constraints, albeit in a very small way.

a) During part of the period of investigation, ntl supplied wholesale cable broadband to AOL for a small minority of its retail customers. In theory, if BT increased the price of IPStream, AOL could have chosen as a substitute to offer broadband using a cable input under this deal, albeit limited to customers in the ntl footprint and requiring end-users to take cable service.116

b) ntl was also selling intermediate services to some third parties using DataStream as an input during the period of the investigation; albeit this was a small fraction of ntl’s total number of cable connections which were self-supplied.

116 See http://www.theregister.co.uk/2003/07/08/aol_rolls_onto_ntl_broadband/.
to residential customers.\textsuperscript{117} If BT raised the price of IPStream, these purchasers could have avoided those increases by using DataStream as an input from ntl. Other ISPs could also consider entering into agreements with ntl for supply of intermediate services using DataStream as an input.\textsuperscript{118}

3.21 Under this approach to measuring market share Ofcom has also excluded sales by vertically integrated companies to their downstream arm. This is because it is considered unlikely that the wholesale parts of those businesses would divert supply away from their own downstream arm in order to supply other retail ISPs. Accordingly, these sales would not have operated as a (direct) constraint on BT at the wholesale intermediate services level during the period covered by the investigation. This effectively excludes sales volumes for cable, since both ntl and Telewest were vertically integrated and self-supplied their downstream businesses. Such exclusions leave BT with effectively a 100% share of remaining sales volumes of IPStream to third parties during the relevant period.

3.22 Figure 3.1 below illustrates two approaches to measuring BT’s market share consistent with direct constraints.

\textbf{Figure 3.1: BT Share of wholesale intermediate service market under direct constraints (March 2002-December 2004)}

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{bt_share.png}
\caption{BT Share of volumes (excluding all self-supply)}
\end{figure}

\textbf{Source: Ofcom from BT Wholesale, ISPs}

\textsuperscript{117} An example of ntl’s supply to third parties was its supply to Tesco: NTL Press Release, \textit{Tesco.com partners NTL business for new ISP launch}, 22 October 2002 \url{http://phx.corporate-ir.net/phoenix.zhtml?c=205406&p=irp&newsArticle_print&ID=934700&highlight}.

\textsuperscript{118} Ofcom notes that treating self-supply using DataStream as part of the market share of BT’s competitors will generate a conservative (i.e. lower bound) estimate of BT’s share in the wholesale intermediate services market. Whilst DataStream requires additional network investments on the part of the provider and allows greater service differentiation than IPStream, BT is able to set the DataStream price subject only to maintaining an adequate margin between it and the IPStream price (and the retail price), and therefore arguably does not provide an additional constraint to IPStream. Therefore in principle it could be included in BT’s share of the market. However, Ofcom has chosen not to include DataStream volumes within BT’s share of the wholesale intermediate services market on the grounds that it would not alter Ofcom’s findings in the dominance assessment in that market.
3.23 The first approach seen in Figure 3.1 above takes BT’s share of volumes sold to third party ISPs. It excludes all self-supply of wholesale intermediate services, i.e. by cable, BT and other ADSL operators using LLU and DataStream. With this measure BT’s market share is close to 100% for the whole period of the investigation because BT is the only significant supplier of IPStream to other ISPs.\footnote{Subject to paragraph 3.20 above.}

3.24 The second market share measure including direct constraints seen in Figure 3.1 above includes all self-supply by firms using all ADSL inputs further upstream and includes market shares attributed to self-supply by operators using DataStream and LLU (but continues to exclude the other sources of self-supply, by cable and by BT itself). The reason for estimating market shares using this approach is that these volume shares reflect sales that may have reflected substitution away from IPStream at the wholesale intermediate services level. That is, some ISPs that are also network operators may have chosen to substitute away from IPStream to self-supply in the wholesale intermediate services market, using the further upstream inputs of LLU or DataStream. Using this measure, BT has a market share consistently in excess of 80% over the period of investigation.

3.25 The two market share measures set out above capture the direct constraints on BT, arising from substitution possibilities in wholesale intermediate services available to ISPs, both to alternative services offered to third parties and to further upstream inputs. With these measures BT’s market share is very high throughout the period at 80% or higher.

3.26 As noted above, there is a limitation with these measures in that they are likely to overstate BT’s market power because they do not reflect indirect constraints on BT. They nonetheless form a useful starting point which indicates the upper bound of BT’s market power as derived from analysis of market shares.

**Indirect constraints**

3.27 As noted above, Ofcom prefers a definition of the market which takes account of both the direct and the indirect constraints on BT. A key part of the assessment of the strength of the indirect constraints on BT in such a market is a calculation of BT’s share of the market so defined. It is possible to impute BT’s market share in the wholesale intermediate services market from the retail market shares of services in the downstream market that use IPStream. This can be explained as follows:

a) where an increase in the price of a wholesale intermediate service such as IPStream is passed through to customers via the prices of retail services, substitution may occur at the retail level away from these IPStream-based services to other retail services such as those supplied by cable operators.

b) If this occurs then a reduction in the demand for IPStream is experienced, because the demand for wholesale intermediate services is a derived demand i.e. it depends on the demand for retail services that use IPStream as an input. If this effect is sufficiently large, it will constrain the independence of action of the supplier of IPStream, BT.

3.28 Figure 3.2 shows the wholesale intermediate shares imputed from retail shares. It shows that BT’s market share on this measure rises over the period of the
investigation from 35% in June 2002 to 62% in December 2004. BT’s imputed share of wholesale intermediate services reflects the retail market shares of all retail suppliers that use IPStream as the wholesale intermediate service for the provision of that retail service. This includes BT’s own retail market share (reflecting BT’s own self-supply) and additionally the sum of the shares of all other retail suppliers who use IPStream as an input. Imputed shares for DataStream and LLU implied by retail market shares are shown separately.

**Figure 3.2: Imputed shares of wholesale intermediate services implied by retail market shares**

![Diagram showing imputed shares of wholesale intermediate services over time]

Source: Ofcom from BT Wholesale, ISPs

3.29 This measure of market share does not attempt to take account, in a quantitative way, of the fact that the constraint that results from substitution by end-users to competitors’ products at the retail level is indirect rather than direct. As noted in Section 2, the indirect constraint at the wholesale level is weaker than the corresponding direct constraint at the retail level because of the dilution effect which arises because the wholesale product accounts for only a portion of the cost (and, by assumption, the competitive price) of the retail service. This means that any wholesale price increase (even assuming it is fully passed through to

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120 BT’s imputed market shares include volumes self-supplied by BT to its retail business and sales to third party ISPs. This figure excludes retail market shares in which DataStream is the upstream input, which is estimated separately.

121 The following can be stated about the relative strength of different direct and indirect constraints:

i) the direct constraint at the retail level is stronger than the indirect constraint at the wholesale level because the latter also depends on switching by retail customers but in response to a price increase which is proportionately smaller than the wholesale price increase which caused it. For example, a 10% increase in the wholesale price will lead (in this case) to a 6% increase in the retail price, which will induce less switching than a 10% increase in the retail price (see Figure 3.3);

ii) the indirect constraint at the wholesale level is stronger in this case than any actually operating direct constraint at the wholesale level. This is because BT is the only significant supplier of wholesale intermediate broadband access to third parties, so direct wholesale level constraints are largely inoperative; and

iii) it is not possible to say whether, if entry by another supplier of wholesale intermediate broadband access to third parties occurred, the resulting direct wholesale level constraint would be weaker or stronger than the indirect constraint identified above. This would depend, inter alia, on the intensity with which the entrant competed and the willingness and ability of wholesale buyers to switch supplier.
customers) will be smaller when expressed as a percentage increase in the retail price than it is when expressed as a percentage of the wholesale price.

3.30 The price of IPStream represents about 60% of the retail price. This implies that a 10% increase in the price of IPStream will raise retail prices by only 6% even with full pass-through. That is, the indirect constraints from cable result from substitution at the retail level which would occur in response to a retail price increase that is about 40% smaller (see Figure 3.3 below).

3.31 Figure 3.3 illustrates how the indirect constraint works by way of diagram. In this illustration, wholesale inputs A and B are not substitutable. Accordingly, there are no direct constraints operating at the wholesale level. Hence there can be no customer substitution to operator B’s wholesale input in response to an increase in the price of operators A’s wholesale input. However, indirect constraints operate because substitution can occur at the retail level in response to an increase in operator A’s wholesale input price. Because the input cost represent 60% of the final price of the retail broadband product, the effect of the price increase is diluted, since for any given percentage increase in the wholesale input price, the retail price increase will be only 60% of that increase. The indirect constraint is therefore weaker than the direct constraint at the retail level.

Figure 3.3: Illustration of impact of indirect constraints at the wholesale level

3.32 Given this, Ofcom considers that, for the purpose of comparison with the levels of market share conventionally considered as indicating dominance, it is appropriate to include indirect constraints imputed from the retail level but that it may aid interpretation to reflect explicitly the effect of dilution. Ofcom uses two methods to achieve this as explained further below.
Method 1

3.33 The first approach (‘method 1’) reduces the market share of operators providing only an indirect constraint on BT’s wholesale prices (i.e. the cable operators) by multiplying it by a ‘dilution factor’ of 0.6. The rationale for use of the 0.6 dilution factor as an adjustment to volume shares is set out above at paragraphs 3.29 to 3.31. The use of this dilution factor suggests that the indirect constraints are 40% weaker than the corresponding direct constraints at the retail level.

3.34 Ofcom allows for the relative weakness of indirect constraints placed upon BT (in the wholesale intermediate services market), by multiplying cable shares by a dilution factor (0.6). Under method 1 this then has the effect of adjusting upward the shares of all non-cable operators (i.e. BT and providers of intermediate services using DataStream and LLU) (see Annex 2).

3.35 Figure 3.4 below shows BT’s market share using this adjustment.

Figure 3.4: Adjustment to wholesale intermediate service shares to reflect weakness of indirect constraint: method 1

Source: Ofcom from BT Wholesale, ISPs

3.36 The results in Figure 3.4 show that BT’s adjusted share (using method 1) is 47% in June 2002 and rising to 71% in December 2004. Although care is needed in interpreting the results, they suggest the significance of taking account of the relative weakness of indirect constraints when using market shares in the assessment of dominance in this market. For further details of Ofcom’s methodology, see Annex 2.

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122 For example, at December 2004, BT’s adjusted share is calculated as follows:

\[
0.71 = \frac{0.62}{0.62 + 0.06 + 0.006 + (0.32 \times 0.6)}
\]

where BT’s unadjusted share is 62%, DataStream is 6%, LLU is 0.6%, and cable represents 32% of the wholesale intermediate services market.
Method 2

3.37 A possible disadvantage of method 1 is that it does not explain why the adjustment factor should necessarily reflect exactly the proportion of the input price to the retail price. Ofcom has therefore considered whether economic theory suggests another way of adjusting BT’s market shares to reflect the relative weakness of indirect constraints. In Annex 2, Ofcom derives a proportionate adjustment factor using two theoretical economic relationships. The first is the theoretical relationship between market power and market shares, and the second is that between the demand for a retail product and the derived demand for an underlying wholesale product.

3.38 This method suggests that an appropriate adjustment is to divide BT’s wholesale share (measured as the share of retail subscribers for which BT supplies the underlying wholesale intermediate broadband service) by the dilution factor of 0.6. A detailed explanation of how this result is derived, and the conditions under which it holds, is found in Annex 2.

3.39 The nature of this market share measure is somewhat different to method 1 described above in that it is underpinned by a formal economic model. The market shares thus derived are an aid to interpretation of the actual wholesale market shares which include all suppliers’ captive sales.\(^{123}\)

Implications of market share analysis taking account of indirect constraints

3.40 Ofcom believes that it is appropriate to regard cable operators as part of the wholesale intermediate broadband services market, and to include their self-supply when calculating shares of this market, even though they do not supply third parties. When wholesale intermediate shares are imputed from the retail market, BT’s market share exceeds 40% from December 2002 and exceeds 50% by October 2003. This measure of the level of BT’s share would itself suggest dominance at least by late 2003. However, conventional measures of market share such as this do not reflect the fact that the constraint on BT’s wholesale prices exercised by cable operators is indirect, and so is weaker than the corresponding constraint at the retail level.

3.41 Therefore, to aid interpretation when comparing these market shares with the benchmarks conventionally considered when drawing inferences about market power, Ofcom has developed two methods of adjusting these shares to reflect explicitly the indirectness of the constraints on BT. Taken together, the adjusted and unadjusted shares shown in Figures 3.1, 3.2 and 3.4 are consistent with BT being dominant in the wholesale broadband intermediate services market in the relevant period.

\(^{123}\) Because the method consists in the application of a factor of 1.67 to the wholesale market share (see Annex 2), it is possible that the adjusted share for BT using this method can equal or even exceed 100%. It is noted that this result needs to be interpreted intuitively. It illustrates BT’s ability to set a higher price-cost margin at the wholesale level than that suggested by unadjusted market shares. An adjusted share of more than 100% may be thought of as suggesting that BT has more market power at the wholesale level than it could achieve at the retail level even if it had 100% of the retail market.
Figure 3.5: Adjustment to wholesale intermediate service shares to reflect weakness of indirect constraint – method 2

Source: BT Wholesale with Ofcom adjustments

Trends in market share

3.42 As noted above, during the period covered by the investigation, the upstream market exhibited some of the characteristics of an immature (but, perhaps, maturing) market and a fast rate of growth. Given this, initial subscriber numbers were small in absolute terms compared to the number at the end of the period. For example, in June 2002 there were over 600,000 broadband subscribers compared to approximately six million in December 2004.

3.43 As set out in paragraph 3.12, stable or persistently high market shares are important considerations in a finding of dominance in mature, established markets. Standard analysis of dominance also places weight on the trend increase in the market share as well as the level in market share over time. This is of particular relevance given the low level of maturity of the broadband market in the period investigated, where the trends may provide a useful indicator of underlying market power.

3.44 As shown in Figure 3.5 above, BT’s share of the market defined by reference to direct constraints only is high throughout the period under investigation. BT’s market shares in the wholesale intermediate services market as imputed from the retail level demonstrate a strong upward trend since June 2002. The increase in BT’s share over time reflects BT’s underlying ‘coverage advantage’ in the provision of IPStream (that is, the fact that BT alone possesses a ubiquitous access network) which is present at June 2002, and manifests itself in an increasing share of the wholesale intermediate services market. As the market has grown, driven by

demand in the retail market, and in the presence of a common national pricing constraint, BT’s coverage advantage means that it benefits at the wholesale level from growth throughout the UK, with no geographic limit to ISP demand for IPStream within the national UK market. On the other hand, cable broadband becomes increasingly constrained by geographic limits of their franchises. BT’s (imputed) share of the wholesale intermediate services market rose from 35% in June 2002 to 62% in December 2004.126

3.45 The trend increase in BT’s market share is also observed in BT’s percentage share of ‘net additions’ in the wholesale intermediate services market. This measure best illustrates how fast BT’s underlying coverage advantage manifests itself in increased ISP demand for IPStream in each month. In a rapidly growing market, share increases of net additions can show more about BT’s ability to expand in the market than a cumulative share measure – as shown in Figure 3.6 - which may mask growth.

3.46 BT’s share of net additions rose from 47% in June 2002 to 76% in December 2004.127 Note that BT’s share of net additions increased from 20% in January 2002 to 47% in June 2002, reflecting BT commitments at that time to meet broadband connection targets. This high and rising share of net additions is reflected in the increase in BT’s market share over the period and in turn likely reflects its coverage advantage, which is discussed further in the next section.

Figure 3.6: BT’s share of net additions (January 2002-December 2004)

Source: Ofcom from BT Wholesale, ISPs

126 Since December 2004, BT’s share has risen to a high of 71% in December 2005 and was 66% as at December 2006.
127 Since December 2004 BT’s share of net additions (DSL and LLU) rose to 73% in April 2005 and was 32% at March 2007: http://www.btplc.com/News/ResultsPDF/q407release.pdf.
Alternative indicators of market power

3.47 In a market that exhibits some of the characteristics of an immature market, and in addition to looking at trends in market shares, there are also other measures of market power which may be more informative than conventional market shares. Conventional market shares may be less reliable because, for example, BT’s lower market shares at the beginning of the period may merely largely be reflective of cable’s earlier push into broadband, which saw cable shares at their highest levels over period of investigation in June 2002 (joint cable shares represented 64%) - an effect which was swiftly reversed by BT during 2002 and thereafter, when BT began to market its broadband products strongly, as reflected in BT’s increasing trend in market share over the period.

3.48 An important advantage that BT had over cable operators is its greater broadband coverage. BT’s coverage advantage exists because in a national UK market BT’s growth is geographically unconstrained (i.e. BT can acquire new connections nationally without restriction from limited geographic reach of the network - see below). In contrast, other operators, such as ntl and Telewest, were constrained to grow their connections within the geographic limits of their franchise regions. It is important to investigate the strength of this advantage and whether it contributes to BT having a position of dominance. Ofcom has considered two related methods for quantifying BT’s coverage advantage: absolute and relative measures of broadband enabled (i.e. ‘addressable’) lines.

Absolute measure of broadband enabled lines

3.49 The total number of premises (i.e. households and businesses) in the UK was about 26 million.\(^{128}\) BT is, theoretically, able to serve essentially all of these households due to the ubiquity of its access network. However, potential ADSL coverage is less than 100% as the technology is subject to distance constraints (i.e. households more than a certain distance from an exchange cannot receive ADSL-based broadband services). By contrast, because the cable access networks are limited in their geographical coverage, they were only able to serve a total of about 13.3 million homes - approximately 8.4 million by ntl and approximately 4.9 million by Telewest. However, of these, only seven million and 4.7 million lines (respectively) were broadband enabled. These figures represent the potential number of households that could receive broadband from BT, ntl and Telewest, in the event that their entire networks were upgraded to support broadband. For the purpose of deriving the absolute and relative addressable line measures, only the percentage of broadband enabled lines are relevant and therefore calculated.

3.50 Figure 3.7 below illustrates the number of premises that were addressable by BT’s broadband-enabled lines at various times. The number is also shown as a percentage of all UK premises that are passed by BT’s network. This percentage rises over the period and reaches 96% by December 2004, reflecting the ubiquity of BT’s network and its progressive roll-out in broadband-enabling exchanges throughout the UK.

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\(^{128}\) Office of National Statistics.
Figure 3.7: BT’s number of premises that are broadband enabled and expressed as percentage of all premises in the UK

Source: Ofcom from Office of National Statistics and BT Wholesale

Relative measure of broadband enabled lines

3.51 BT’s share of addressable lines is another useful indicator of BT’s coverage advantage relative to cable operators. Unlike the assessment of the absolute number of premises that are addressable by BT’s broadband-enabled lines, BT’s share of addressable lines takes account of the overlap between BT addressable lines with broadband enabled cable in the ntl and Telewest geographic footprints. In these overlapping areas, premises can be served by multiple addressable lines. Accordingly, BT’s share of addressable lines will depend on the extent to which other network providers have invested in a broadband network.

3.52 For example, BT’s relative share of addressable lines is calculated as BT’s addressable lines (e.g. as at December 2004, 23.9 million) divided by the sum of its addressable lines and those of the cable networks (23.9 million + 4.7 million + 7 million = 35.6 million).129 This share remained relatively stable over the period, between 60% and 70% between June 2002 and December 2004.

3.53 Figure 3.8 below illustrates that BT had the largest share of addressable lines in the UK over the period of the investigation. BT’s lowest share of addressable lines was 60% in September and December 2002. Hence, BT’s share was not only larger than each of the cable operators, but also larger than the cable operators combined. This measure suggests that BT’s coverage advantage is significant and persistent over the period of investigation.

129 Office of National Statistics.
3.54 Figure 3.8 below further illustrates the tendency for the convergence of BT’s and other cable operators’ actual market shares to their respective shares of addressable lines. BT’s actual share of customers was rising over time towards convergence with its share of addressable lines, whereas for each of ntl and Telewest, its actual share of customers is falling over time, again to converge with or in the case of Telewest, going beyond their respective share of addressable lines.\textsuperscript{130}

3.55 Ofcom notes that in Figure 3.8, Telewest’s share of addressable lines fell while BT’s share of addressable lines rose over the period of the investigation. In the case of ntl, its share rose and then fell back, but remained higher at the end of the period (20%) than the start of the period (18%). These movements in share reflect that while the geographic footprints (and therefore the number households passed) were fixed for each operator, the rate at which BT’s connections to homes passed became broadband enabled was greater than that achieved by Telewest (and from October 2002, ntl). For example, the number of BT enabled lines as a proportion of total homes passed increased from 65% to 96% between June 2002 and December 2004, whereas the increase was 95% to 96% for Telewest. This resulted in a reduction in Telewest’s share of addressable lines from 18% to 13% over the period, whereas BT increased its share from 65% to 68%.

**Figure 3.8: Broadband percentage share of addressable lines (all premises) and actual market shares before adjustment: June 2002 – December 2004**


3.56 Taking into account the evidence set out above, in Ofcom’s view, the significant gap between BT’s actual and addressable shares of the market at the start of the period was not due to an absence of market power, but rather a transitional feature of an immature market that diminished over the period. BT had a source of market

\textsuperscript{130} Figure 3.8 shows the comparison of actual shares of subscribers imputed from the retail level. These shares have not been adjusted to reflect the relative weakness of indirect constraints (i.e. the dilution factor has not been applied). This is not necessary to illustrate the convergence of shares of actual and addressable lines, which is clearly apparent in the unadjusted data.
power, i.e. its coverage advantage (as measured by its absolute and relative share of addressable lines), from the beginning of the period. But it was not until 2002 that BT became more active in seeking to acquire broadband subscribers and from this point on it began to convert its addressable share advantage into an actual market share advantage.

3.57 As discussed at paragraph 3.47, the cable operators’ share imputed from the retail level (unadjusted) of the market was, at 64%, its highest point over the period of the investigation, at June 2002. This reflects the fact that cable companies had been actively seeking out broadband customers for their networks at an early stage of market development. In contrast BT’s share was at its lowest in the same month. These actual imputed (unadjusted) shares reflected the initial conditions in which cable operators sought broadband customers earlier and more vigorously than BT. In February 2002, BT then set broadband connection targets, and began implementing policies to meet these targets. Taking advantage of its coverage advantage, BT was able to raise its share rapidly. Figure 3.6 (above) illustrates the rapid growth in BT’s actual share over this period, where BT’s share of net additions increased from 20% to almost 50% in the first half of 2002. In contrast, the earlier temporary benefit cable companies obtained in the form of a higher share of connection began to fall away rapidly, since cable companies’ networks are limited in their geographic reach.

3.58 This view is supported by evidence in the form of statements by BT which indicated that it made broadband a commercial priority during 2002. For example, in a news release of February 2002, Ben Verwaayen, Chief Executive, said:

“Broadband is the future for Britain and we’re putting it at the heart of BT’s plans for growth in the UK mass market. This will drive the whole market forward by making broadband affordable, attractive and accessible.”

3.59 Other public statements from BT include:

“Broadband will be at the heart of BT. To help achieve its intent of 5 million UK connections by 2006…”

Paul Reynolds, chief executive of BT Wholesale, said: "I am delighted by the huge increase in demand for broadband. The results are excellent: installations of more than 11,000 a week, and a customer base for BT Wholesale of almost a quarter of a million connections. With results like this I’m confident we’ll more than meet the targets we have set ourselves. We’ve taken great strides towards broadband Britain, and BT Wholesale is making it happen.”

3.60 The timing of these announcements, combined with the market share analysis above, shows that, once BT began to market aggressively, it rapidly increased its market share whilst cable shares fell, despite maintaining their own marketing efforts, an observation consistent with BT having a dominant position in the relevant market.

131 The first ADSL retail service was available in 2000, after cable modem became available in 1999.
132 BT news release, Verwaayen sets out new strategy for BT, 10 April 2002.
133 BT news release, Two thirds of the UK now on BT’s broadband map, 30 May 2002.
Conclusion on market share and growth assessment

3.61 It is well established that a persistently high market share (e.g. over 50%) is indicative of a dominant position. However, the application of this precedent is not straightforward in the wholesale intermediate residential broadband market. The lack of direct constraints, existence of indirect constraints and the immaturity of the market all make interpretation of conventional market share measures difficult. Accordingly Ofcom has looked in the round at a range of market share measures as an aid to interpreting market power in this market.

3.62 Ofcom has shown that BT had a very high share of the wholesale intermediate services market when only operators providing direct wholesale-level constraints on BT are taken into account (see Figure 3.1). Using a measure of market share that excludes all self-supplied volumes from the calculation, BT’s share is effectively 100% over the period. Even if self-supply using DataStream and LLU is included (but still excluding self supply by cable and BT), BT’s share remains very high (above 80%) throughout the period. While these measures of shares of direct constraints are relevant to assessing BT’s dominance, they tend to overstate BT’s market power by ignoring indirect constraints from cable.

3.63 When wholesale intermediate shares are imputed from the retail market, BT’s market share exceeds 40% from December 2002 and exceeds 50% by October 2003. Although this measure of the level of BT’s share does not itself suggest dominance at the start of the period, interpretation of the evidence needs to take account of the tendency for this unadjusted measure to understate BT’s market power by failing to reflect the relative weakness of indirect constraints (that is, relative to the corresponding direct constraint at the retail level) and of the upward trend in BT’s share (however measured) over the period.

3.64 Therefore, in order to aid comparison of market shares with levels conventionally considered when drawing inferences as to market power, Ofcom has adjusted BT’s wholesale market share to take into account the indirectness of constraints placed upon BT.

3.65 Ofcom has identified two measures of market share that provide an aid to illustrating the significance of the relative weakness of the indirect constraints. Although both need to be interpreted with care, both suggest that, in the present case, the relative weakness of indirect constraints is a significant factor when using market shares to assess dominance.

3.66 Accordingly Ofcom has also had regard to BT’s rising share of the wholesale intermediate services market (imputed from the retail market and including cable) which provides some evidence of dominance, particularly in the later part of the period. As indicated in Figure 3.6, in all but two of the 31 months during the period of the investigation BT was acquiring broadband customers more rapidly than its wholesale competitors and in most of the period its share of net additions was above 50%, i.e. it was acquiring more broadband customers than its competitors combined.

3.67 An important source of dominance for BT over the entire period was its high level of broadband coverage in absolute terms and relative to cable. BT’s coverage advantage was both significant and persistent throughout the whole period, with a share of addressable lines lying between 60% and 70% over the period and an absolute share rising to 96% (i.e. the percentage of BT’s own lines which were broadband enabled) by December 2004.
When interpreting the available evidence on market shares and growth Ofcom has taken into account the fact that nearly all of the constraints on BT were indirect, and the immaturity of the market, especially at the start of the period. Assessing all the evidence in the round, Ofcom concludes that it supports a finding of dominance for BT in the market for wholesale intermediate services in the UK over the whole period between June 2002 and December 2004.

**Barriers to entry and expansion**

**Economies of Scale and Scope**

The significant economies of scale, scope and density that characterise telecommunications access networks are likely to contribute to the barriers for a supplier seeking to enter the wholesale intermediate services market, because they suggest that an entrant would need to achieve a significant share of the market for its costs to reach an efficient level (see below). This could suggest that prices post-entry would fall, reducing expected profitability.

During the period covered by the investigation, BT benefited from considerable economies of scale that were unlikely to have been available to new entrants. In particular, large economies of scale were present in both the DSLAM and backhaul elements of wholesale intermediate services. This is because the more end users there were at the remote concentrator level (i.e. the element of the network nearest the customer), the lower the unit costs per connection, as the fixed costs were spread over a larger number of connections. BT had scale advantages compared to a new network entrant in the provision of access lines; it also had scale advantages compared to an LLU operator (“LLUO”) at the DSLAM level, as on entry the LLUO has fewer broadband connections per DSLAM than BT, and therefore a higher unit cost.

BT and the cable companies also benefited from non-network economies of scale. There are certain costs that increase less than proportionately with the number of subscribers, such as billing, finance systems, and, to a certain extent, back office staff. LLUOs and suppliers of intermediate services using DataStream service, by purchasing wholesale elements from BT, benefit to a certain extent from BT’s network economies, but as a result of lower subscriber numbers, have higher unit overheads.

BT and the cable companies also benefited from significant economies of scope in the wholesale intermediate services market, as they operate in other wholesale fixed access markets. The economies of scope related mainly to duct infrastructure that supported not only broadband services but a range of other telecommunications access services. These economies of scope acted as a further barrier to entry to this market, as they provided a cost advantage compared to new entrants. This point is relevant to new entrants having to build new access infrastructure (rather than new entrants providing wholesale intermediate services based on DataStream or LLU services bought from BT).

Ofcom concludes that there are significant economies of scale and scope in the wholesale intermediate services market for suppliers with their own ADSL or cable network infrastructure. These stem largely from the fact that, as subscriber numbers increase, network-related unit costs fall. This is consistent with BT having dominance in the market for wholesale intermediate services used for supply of residential services in the UK.
3.74 There were significant sunk costs for suppliers wishing to offer wholesale intermediate services based on ADSL or cable during the period under investigation.

**Competitors who wished to own their own local access network**

3.75 The barriers to entering the market at the local access network level include the substantial sunk costs associated with building a local access network, installation of the network elements required to support broadband traffic (i.e. DSLAMs and Universal Broadband Routers) and building additional network to carry traffic from the DSLAM or fibre node to the core network ('backhaul'). Building network infrastructure is costly and time-consuming and therefore difficult for new entrants to achieve.

3.76 The cable companies (in the areas where they already have local narrowband access networks) and BT had already incurred significant sunk costs in order to enter the wholesale intermediate services market. These costs related only to the task of enabling existing narrowband networks to support broadband traffic. A completely new entrant, building a network from scratch, would have faced not only the type of costs that were incurred by BT and the cable companies when they enabled their narrowband networks to offer broadband services, but significant sunk costs associated with building local access networks and backhaul. These further network build costs are likely to have been significantly greater than the costs that were faced by BT and the cable companies when they enabled their narrowband networks to offer broadband.

3.77 If the cable companies had chosen to expand into areas where they did not currently have local access networks and backhaul, they would have faced similar costs to new build operators (and, during the period under investigation, they did not do so). BT, on the other hand, would have had only to invest in enabling local exchanges for ADSL in order to expand the potential number of customers it could reach (and, as noted previously, did so). This upgrade cost is much lower than that which would be incurred by the cable companies if they had decided to expand the geographical reach of their networks.

3.78 Whatever the pre-entry price set by incumbent providers of wholesale intermediate services (i.e. their current prices), what matters for the profitability of new entry is the price that would arise from competition between firms post-entry. Therefore, the high sunk costs of entry and the potential for reduced prices post-entry were possible deterrents to new operators entering the wholesale intermediate services market over any timescale that would have constrained the behaviour of BT during the period covered by the investigation.

**Competitors who wished to take advantage of LLU**

3.79 Suppliers buying unbundled local loops supplied by BT can obtain cost-based wholesale local access and backhaul from BT, which they can then use to supply wholesale intermediate services. This means they are able to compete with BT and cable companies in the market without having to incur the substantial sunk costs of access network build. However, during the period under investigation, LLUOs had little impact on the market for wholesale intermediate services: their market share remained low, and was less than 2% between June 2002 and December 2004, and in general they tended to focus on supplying business, rather than residential, services.
3.80  As mentioned above, LLUOs can avoid the sunk costs of access network build. However, they still face substantial fixed costs, for example those associated with co-location (access to BT’s local exchange) and LLU backhaul (capacity between local exchanges and core network nodes) and entry of LLUOs did not materially affect competition in the wholesale intermediate services market during the period of the investigation. During that time, LLU was not sufficiently attractive commercially because of the terms and conditions on which LLU was offered, the investments that needed to be made, and the economies of scale. These factors acted as significant barriers to entry and expansion.

3.81  As discussed above, since the period of the investigation, there has been a marked change in the commercial attractiveness of LLU. However, the timing of these developments means that they occurred too late to affect the assessment of dominance during the period of the investigation.

Competitors who wished to take advantage of DataStream

3.82  By December 2004, fewer than 8% of all ADSL-based connections used DataStream (6% of the total wholesale intermediate services residential market). By far the largest (self-provider) of wholesale intermediate services using DataStream was Tiscali. As at December 2004, Tiscali was purchasing approximately 236,000 of the 340,000 DataStream connections supplied by BT. Tiscali purchased DataStream for the provision of 67% of its retail connections, the remainder being supplied using IPStream. This means that Tiscali, in effect, self-provided wholesale intermediate services for 67% of its connections. Tiscali’s strategy was focused on the provision of entry-level broadband retail services with download speeds typically below 512kbit/s. BT’s wholesale intermediate services were not designed to support such services (until the introduction of capacity based charging). In contrast the further upstream input of DataStream had a more flexible capacity based charging structure and so was better suited to support such lower bandwidth services. The advantages of using DataStream to support Tiscali’s business model appear to have outweighed the disadvantages with the product as outlined below.

3.83  In order to use DataStream, the supplier needs to have its own core network, which requires sunk investment in infrastructure. This does not preclude an existing network operator purchasing DataStream to provide wholesale intermediate services to its own retail ISP or to third parties. But during the relevant period, potential entrants may have found entry unattractive due to the size of the margin between DataStream and IPStream or the terms of the migration. As set out in paragraph 2.36, on 26 August 2004 Ofcom made a direction setting the margin between DataStream and IPStream which was expected to encourage suppliers to use DataStream in order to offer wholesale intermediate services to third parties.

3.84  In addition, suppliers experienced significant difficulties in migrating connections from IPStream to DataStream. Charges for migration were high and the process was insufficiently automated, resulting in limited take-up: by March 2004 only 7.6% of all ADSL-based connections used DataStream. Ofcom intervened in August 2004134 to reduce migration charges and require BT to provide a migration process within the same timescales as the processing of a ‘new provide’ order for an end user. This was expected to increase take-up of DataStream in future, but for the

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134 Ofcom, Direction concerning ADSL Broadband Access Migration Services; and a Determination to resolve a dispute between Tiscali, Thus and BT concerning ADSL Broadband Access Migration Services, 9 August 2004 http://stakeholders.ofcom.org.uk/binaries/consultations/bam/statement/statement.pdf.
period under investigation the migration process can be seen as a significant barrier to entry.

Alternative broadband access technologies

3.85 Alternatives to ADSL and cable modem (which could, potentially, be used to supply wholesale intermediate services), tend to be broadband-specific access technologies, that is, as in the case of, for example, satellite, they are not based on enabling of an existing narrowband platform to support broadband. These technologies require the creation of new access networks. As such, they do not incur the broadband costs associated with enabling ADSL and broadband cable networks. However, suppliers need to make considerable sunk investments in developing and building alternative access networks, and in backhaul.

3.86 Ofcom considers that alternative broadband access technologies, including satellite, did not have a significant effect on competition during the period of the investigation. These technologies were not invested in as large-scale commercial propositions, nor were there significant investments undertaken to establish such technologies as mass-market services.

Conclusion on barriers to entry

3.87 Ofcom concludes that there were significant barriers to entry to the wholesale intermediate services market. Entrants seeking to invest in a new access network would face considerable sunk costs, as would ntl and Telewest if they decided to expand their footprint. During the period covered by the investigation LLUOs made little impact on the market because of the relatively unattractive terms and conditions of LLU given the costs including co-location and LLU backhaul. Potential suppliers of wholesale intermediate services using DataStream did not find it attractive as a result of the administrative burden and cost of migration and the margin available between DataStream and IPStream. Suppliers using alternative broadband access technologies faced high sunk costs and uncertainty over the viability of their business models. Ofcom therefore concludes that significant barriers to entry exist in the wholesale intermediate services market. This is supportive of a conclusion of BT’s dominant position in the market for wholesale intermediate services in the UK during the period of the investigation.

Countervailing buyer power

3.88 The Commission, OFT and Competition Commission all examine countervailing buyer power in assessing any market power which may arise from a merger. For example, the European Commission states in its Guidelines on Horizontal mergers that even

“…firms with very high market shares may not be in a position post-merger, to significantly impede effective competition, in particular by acting to an appreciable extent independently of their customers, if the latter possess countervailing buyer power. Countervailing buyer power in this context should be understood as the bargaining strength that the buyer has vis-à-vis the seller in commercial
3.89 The OFT’s Guidelines note, however, that

“Size is not sufficient for buyer power. Buyer power requires the buyer to have choice.”

3.90 The OFT Guidelines set out a number of factors in assessing whether there is countervailing buyer power:

a) the buyer is well informed about alternative sources of supply and could readily, and at little cost to itself, switch substantial purchases from one supplier to another while continuing to meet its needs;

b) the buyer could commence production of the item itself or ‘sponsor’ new entry by another supplier (e.g. through a long term contract) relatively quickly and without incurring substantial sunk costs;

c) the buyer is an important outlet for the seller (i.e. the seller would be willing to cede better terms to the buyer in order to retain the opportunity to sell to that buyer); and

d) the buyer can intensify competition among suppliers through establishing a procurement auction or purchasing through a competitive tender.

3.91 Ofcom considers these points below.

A well-informed and price sensitive buyer

3.92 Ofcom considers all ISPs were well-informed and price sensitive but that they were constrained to use IPStream. An ISP would not, for example been able to readily switch from purchasing IPStream to another product or technology to serve the bulk of its customers, during the period covered by the investigation. For instance, if an ISP that wished to serve customers using DataStream, the ISP would have needed to incur additional network investments that would have been necessary to use this service to produce wholesale intermediate services capable of supporting a retail ISP’s activities. Accordingly Ofcom does not consider that ISPs could have readily switched to alternative upstream inputs for the bulk of their customers.

The buyer as an important outlet for the seller

3.93 Countervailing buyer power is present where downstream purchasers of an upstream input have strong buyer positions (especially where the downstream purchaser is a monopsonist, i.e. the only purchaser of that product or service) and can negotiate lower prices by reducing the quantity purchased, such as by threatening to buy the product or service from a different supplier. Current and potential future customers of BT’s wholesale intermediate services were unlikely to have possessed sufficient countervailing buyer power to undermine BT’s market power. These customers would have had countervailing buyer power only if they could have credibly threatened to take their custom elsewhere, thereby forcing BT

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136 OFT, Assessment of market power, Understanding competition law, chapter 6.
to offer its products at lower prices, or at a higher specification; but the opportunities for doing so were extremely limited.

3.94 It is also noted that the two largest retail suppliers of ADSL-based residential broadband services during the period covered by the investigation were BT Broadband and BT Openworld (which were separate divisions of BT during the period of the investigation), which have a combined broadband subscriber base twice that of the nearest competitor, AOL, and account for a total of 35% of BT's intermediate services sales compared to 18% for AOL and 13% for Orange, the largest non-BT customers.\textsuperscript{137}

**Ability to self supply**

3.95 While there were other options to enable self-supply, i.e. DataStream and LLU, these require much greater investments and the terms and conditions available during the period under investigation were relatively unattractive and were not widely used.

**Lack of alternative sources of supply and option not to purchase or to delay**

3.96 During the period of the investigation retail broadband providers had almost no effective alternative to purchasing wholesale intermediate services from BT (although Ofcom notes the wholesale intermediate services that ntl provides to AOL and using DataStream as an input).

3.97 Ofcom therefore considers that customers of BT's wholesale intermediate services were unable to exercise significant countervailing buyer power during the period of investigation.

**Conclusion on dominance**

3.98 Given Ofcom's analysis of market share and growth, barriers to entry and expansion and economies of scale and scope, Ofcom concludes that BT was dominant in the market for residential wholesale intermediate broadband services in the UK\textsuperscript{138} over the period June 2002 to December 2004.

**The whole or a substantial part of the Common Market**

3.99 In determining whether Article 102 TFEU and/or the Chapter II Prohibition apply, it is necessary to consider the territory within which the dominant position is held. In the case of Article 102, the dominant position must be held in the whole or a substantial part of the common market. In the case of the Chapter II Prohibition, the dominant position must be held within the United Kingdom or any part of it.

3.100 BT is dominant in the market for resident wholesale intermediate broadband services within the whole of the UK. BT’s dominant position within the UK also constitutes a dominant position within a substantial part of the common market.

\textsuperscript{137} BT Wholesale, as at December 2004.

\textsuperscript{138} Excluding the Hull area: the area defined as the 'Licensed Area' in the Licence granted 30 November 1987 by the Secretary of State under section 7 of the Telecommunications Act 1984 to Kingston upon Hull City Council and Kingston Communications (Hull) plc.
Section 4

Margin Squeeze

Introduction

4.1 Margin squeeze has been recognised as a category of abuse by the Commission,139 the General Court and ECJ,140 the OFT,141 the CAT142 and the Court of Appeal.143 That case-law shows that the following criteria are relevant to the assessment of a margin squeeze:

a) First, the abusive undertaking must be vertically integrated, i.e. it must operate in related upstream and downstream markets, its upstream operations providing an input both to its competitors and to its own operations in the downstream market.

b) Second, the abusive undertaking must enjoy a dominant position in the upstream market (with a need for access to an input from the upstream market in order to operate in the downstream market).144

c) Third, the undertaking must be active in the downstream market such that its pricing decisions in that market are capable of influencing downstream competitive conditions, but is not required to be dominant in that market.145

d) Fourth, the undertaking must fail to maintain a sufficient margin between its upstream and downstream prices such that competition may be restricted in the downstream market. Ofcom considers that the appropriate test of sufficiency in this case is whether the margin is enough to cover the dominant undertaking’s own costs in the downstream market (or those of an equally efficient operator).

140 Industrie des poudres sphériques Case T-5/97 [2000] ECR II-3755; Deutsche Telekom Judgment of the ECJ (Second Chamber) 14 October 2010.
141 BSkyB OFT decision 17 December 2002, No CA98/20/2002; Genzyme OFT decision 27 March 2003, No CA98/3/03; and Albion Water Decision dated 26 May 2004 of the Director General of Water Services.
143 Dwr Cymru Cyfyngedig v Albion Water [2008] EWCA Civ 536.
144 In Napier Brown/British Sugar, British Sugar was found to be dominant in the upstream market of white granulated sugar for both retail and industrial sale in Great Britain (paragraphs 50-60). In Deutsche Telekom, Deutsche Telekom was found to be dominant in the market for access to local fixed networks at the wholesale level (see paragraphs 96 -101) (decision upheld by the ECJ). In Genzyme, the abusive undertaking was found by the OFT to be dominant upstream and this was upheld by the CAT on appeal (at paragraphs 285-286).
145 Genzyme (at paragraphs 489-491): “Cases such as Commercial Solvents [Cases 6&7/73 [1974] ECR 233], Télémarketing [Case 311/84 [1985] ECR 3261] and Tetra Pak II [Case C-333/94 P [1996] ECR I-5951] demonstrate that it may well be an abuse for an undertaking which is dominant in one market to act without objective justification in a way which tends to monopolise a downstream, neighbouring or associated market … [T]he abuses found in the case law essentially involve a company which is dominant in one market extending its monopoly into a separate or related market to the exclusion of competitors who would otherwise be able to compete in that separate market …A further particular example of the same general principle may occur where an undertaking that is dominant in an upstream market supplies an essential input to its competitors in a downstream market, in which the company is also active, at a price which does not enable its competitors in the downstream market to remain competitive. Such a practice is called a ‘margin squeeze’ or ‘price squeeze’.”
This is the test consistently applied in OFT and Commission decisions and given endorsement by the ECJ most recently in Deutsche Telekom.  

4.2 For the reasons set out in Sections 2 and 3, Ofcom considers that the first three criteria are met. For the reasons set out below, Ofcom has concluded on the evidence in this case that the fourth criterion is not met.

4.3 Where a competition authority is assessing conduct under the Chapter II Prohibition and/or Article 102, it is not required to demonstrate an intention on the part of the dominant operator to engage in abusive conduct. As set out in the judgment of the ECJ in the case of Michelin, a firm in a dominant position:

“has a special responsibility not to allow its conduct to impair undistorted competition in the common market”.

4.4 In determining whether or not the conduct is abusive, the ECJ in Hoffman La Roche set out that:

“The concept of abuse is an objective concept relating to the behaviour of an undertaking in a dominant position which is such as to influence the structure of a market where, as a result of the very presence of the undertaking in question, the degree of competition is weakened and which, through recourse to methods different from those which condition normal competition in products or services on the basis of the transactions of commercial operators, has the effect of hindering the maintenance of the degree of competition still existing in the market or the growth of that competition.”

4.5 A competition authority is not required to demonstrate that the conduct under investigation actually had an adverse effect on competition within the relevant market. In Compagnie Maritime Belge, the General Court determined that, where there is evidence that a dominant undertaking has engaged in a course of action with the aim of removing a competitor, “the fact that the result sought is not achieved is not enough to avoid the practice being characterized as an abuse of a dominant position.”

4.6 The Commission has indicated in its guidance on the application of Article 102 TFEU that the aim of its enforcement activity in relation to exclusionary practices is to prevent anti-competitive foreclosure resulting in harm to consumers. The Commission will therefore consider the extent to which there is consumer harm in relation to an alleged infringement in deciding upon whether or not to begin or to continue its investigation.

4.7 However, as the CAT set out in National Grid PLC v The Gas and Electricity Markets Authority, it is not necessary to demonstrate a direct adverse effect on consumers. Once a competition authority has established that a particular course of action resulted in significant actual and potential foreclosure of competition and was not

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146 In Napier Brown/British Sugar and Deutsche Telekom, the Commission stated that an abuse will occur where the differential does not cover the dominant undertaking’s own costs in the downstream market (and the Deutsche Telekom decision was upheld by the ECJ in October 2010). The Commission also took this approach in Telefonica (paragraph 312) as did the OFT in BSkyB and Genzyme.

147 Case C-322/81 [1983] ECR 3461, paragraph 57

148 Case C-85/76 Hoffman-La Roche v Commission [1979] ECR 461, paragraph 91

149 Joined cases T-24/93, T-25/93, T-26/93 and T-28/93, 1996 ECR-II 1201, paragraph 149

150 Ruling on permission to appeal in Case 1099/1/2/08 at paragraphs 11 and 12
objectively justified, there is no need to consider further whether there is a direct adverse effect on consumers.

4.8 BT submits that there are various further criteria which must be met in order to show a margin squeeze.\(^{151}\) However, since Ofcom does not consider that the fourth criterion has been met, Ofcom does not consider it necessary in this case to decide whether any additional criteria should be employed in determining whether or not a margin squeeze has occurred in this case.

**Summary of BT’s pricing practices during the period**

4.9 In the light of the criteria set out above, Ofcom has considered BT’s pricing practices during the period under investigation at both the retail and wholesale levels in order to determine whether or not BT engaged in a margin squeeze. A fuller account of BT’s pricing practices during the period under investigation is set out in Section 2.

4.10 In summary, at the retail level, BT’s prices for broadband products during the period ranged from £17.99 per month to £40.99 per month for download speeds of between 512kbit/s and 2Mbit/s, with a connection charge of up to £85 during the period under investigation. Typically, such retail products were subject to monthly usage caps ranging between 1GB and 15GB.

4.11 At that time, at the wholesale level, BT employed a range of tariff structures according to download speed and usage type. For example, IPStream Home 500, one of the original IPStream products offering a maximum downstream speed of 500kbit/s, was launched at a monthly rental charge of £25, with a one-off connection charge of £50. The monthly charge was reduced to £14.75 from 1 April 2002, and further reduced to £13.00 from 1 May 2003. IPStream Home 1000, with a maximum downstream speed of 1Mbit/s, was available from 20 November 2003 at £23 per month, with a one-off connection charge of £50.

**Approach to evaluation of a sufficient margin**

4.12 In considering the appropriate framework of analysis in this case, Ofcom has considered:

   a) what measure of costs is relevant to the assessment of downstream profitability; and

   b) what method is appropriate to measure downstream profitability.

4.13 Ofcom has assessed the evidence against those criteria. In doing so, Ofcom recognises the need for any evidence put forward to be “robust and soundly based”\(^{152}\) or “strong and compelling”\(^{153}\), in order to overturn the presumption of innocence to which an undertaking is entitled to find a breach of competition law.\(^{154}\)

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\(^{151}\) In summary, BT has suggested that it is necessary for Ofcom to prove that: BT’s upstream prices were excessive or its downstream prices were predatory (based on the General Court’s judgment in *Industrie des poudres sphériques*) (BT’s First Response, paragraph 162 and see also BT’s Second Response, paragraph 31); and BT had exclusionary intent or, failing this, that such intent can be clearly inferred from an examination of the circumstances (BT’s First Response, paragraph 178 and BT’s Second Response, section 4 of Part IV).

\(^{152}\) *Aberdeen Journals (No. 2) v. OFT* [2003] CAT 11 [2003], paragraph 125.

\(^{153}\) *Napp Pharmaceutical Holdings Limited and Subsidiaries v Director General of Fair Trading*, paragraphs 91-113.

\(^{154}\) In *JJB Sports plc and Office of Fair Trading* [2004] CAT 17, paragraph 200 the CAT found that:
Measure of Costs

LRAIC and AVC

4.14 Ofcom considers that the appropriate cost standard to apply in determining margins in this case is long-run average incremental cost (“LRAIC”), which is the relevant application of the commonly used concept of average variable cost.

4.15 In assessing the potential margin squeeze in this case, relevant revenues should be compared to the variable or incremental cost of output, i.e. do revenues cover the variable or incremental cost of the relevant output under investigation? The relevant output in this investigation is subscriptions to residential broadband internet access services. The costs that are variable or incremental to that output, however, depend on the relevant time horizon taken. In general, this time horizon may not coincide with the period of investigation – it may be shorter or longer depending on the specific nature of the conduct and the life of the assets involved.

4.16 Ofcom considers that two relevant factors in the decision on the relevant time horizon for assessment are (a) the period over which the ‘low’ prices prevailed; and, (b) whether the prices were temporarily low and expected to rise in the future.

4.17 In relation to (a), Ofcom has considered whether the prices that have prevailed are expected to remain at current levels (or fall) in the future. This is because if prices were considered to be at a level to stimulate market development, but were expected to rise in the future, an argument could be made that the period of variability should be limited to the period under investigation. In the circumstances of this case, BT’s prices were sustained without increase over a period of more than two and a half years (and actually reduced when taking account of all relevant connection, equipment charges or the subscription charge reductions on 1 July 2004). In relation to (b), there has been no suggestion that the prevailing prices are a ‘special offer’ for a limited time, and would be expected to return to a ‘normal price’ in the future. This suggests that the relevant time horizon over which incremental costs should be considered would be at least two to three years (as the prices have already prevailed for over two years).

4.18 Ofcom notes that in some circumstances a short-run measure of costs (in particular, short-run marginal or variable cost, measured over a period such as a month) would be appropriate. However, Ofcom considers that this approach would not be relevant in this case particularly given the sustainability of price over a two to three year period which supports taking a long run approach to the relevant time horizon.

The relationship between total, variable and incremental costs

4.19 Where there is a single output it will be relatively easy to calculate average variable cost, average fixed cost and average total cost. The concepts are related: in particular, in the long run, when all costs are variable, average variable cost converges to average total cost.

“In these circumstances, in applying the balance of probabilities in a case involving penalties, the Tribunal must be satisfied that the quality and weight of the evidence is sufficiently strong to overcome the presumption that the party in question has not engaged in unlawful conduct. For example, if in a borderline case the decision is finely balanced and the Tribunal finds itself to-ing and fro-ing, the correct analysis is that the evidence is not sufficiently strong to satisfy the Tribunal on the balance of probabilities that the infringement occurred.”
4.20 If the increment used to calculate LRAIC is taken to be the total output of the single good or service produced by the firm, LRAIC will be equal to long-run average variable cost and also equal to average total cost.

4.21 However, the concept of incremental cost is more relevant to a multi-product firm. In a multi-product firm, total costs are the sum of common costs and the incremental costs of all the individual products. Where the time horizon is taken to be the long run, the relevant approach to determining the cost standard is a long-run incremental cost approach in which all costs tend to become variable (including short-run fixed costs). By applying this cost standard to the relevant increment of output, LRAIC will approximate to AVC, which is the relevant cost standard when undertaking a margin squeeze investigation. This position is consistent with the guidance issued by the Commission on the Application of Article 102 and the OFT in relation to the assessment of abuses of a dominant position.

Consolidated profit measure (set of products to be considered)

4.22 Ofcom considers that the appropriate set of products to consider in the margin squeeze analysis is that comprising all of BT’s consumer broadband products rather than individual products. This is for three reasons: one related to costs, one related to revenues and one related to the principle of the equally efficient operator test within a competitive analysis.

4.23 The argument relating to costs is that a test based on all products allows the most straightforward comparison of revenues with costs. If individual products were to be considered, then applying the LRAIC cost standard would require the exclusion of costs common to more than one product (such as management, some marketing and certain network costs) on the basis that those costs are not relevant to incremental decisions regarding the individual product (which should be assessed in terms of their contribution to recovery of common costs).

4.24 However, the overall profitability of products sharing common costs should also be considered in an analysis which includes the common costs shared across those products, in order to assess whether the set of products as a whole generate enough profit to recover the costs which are common among those products; a combinatorial test. If they do then the products as a whole can be regarded as profitable; if they do not cover those common costs then the firm would be better off not selling any of the products among which those costs were common.

4.25 Assuming that the majority of common costs are attributable to different BT consumer broadband services, the combinatorial test is effectively the same as an incremental test for the consolidated consumer broadband products taken as a whole, as this aggregates the individual product’s costs with the common costs to provide an effective incremental measure of profitability to the set of common products.

4.26 The revenue-based argument for considering all of BT’s consumer broadband services rather than individual services relates to BT’s stated strategy of attracting

155 Guidance on the Commission’s enforcement priorities in applying Article 102 of the TFEU to abusive exclusionary conduct by dominant undertakings at paragraph 80.

156 OFT 417, Competition Act 1998, The application in the telecommunications sector at paragraphs 7.7 to 7.10; OFT 414a Assessment of conduct, Draft competition law guideline for consultation at paragraph 4.10.
customers to its lower-priced services and then ‘migrating’ them up to its higher value services as customers decide they want the benefits offered from these more expensive services. To an extent, therefore, it makes business sense to be willing to sustain limited short-term losses on lower-priced services if customers are migrating up the value chain to more profitable, higher priced services. Thus losses for a lower priced product could be justified, in a commercial sense, to the extent that they were expected to be recovered from incremental profits attributable to those migrating customers. Other ISPs may also be willing to adopt a similar commercial strategy. The potential for this casual relationship between profits and different products suggests that a consolidated view of profit may be more meaningful.

4.27 Finally, the argument for considering all of BT’s consumer broadband services rather than individual services, relating to the use of the equally efficient operator test is that BT’s competitors also adopt the same commercial strategy in that they typically offer a range of broadband services ranging from entry-level to more expensive broadband services. To assess profitability on the basis of an individual product would not reflect the underlying business model on which BT’s competitors base their pricing and investment decisions. In Ofcom’s view, the appropriate scope of the test depends on the range of products over which suppliers compete, since if all suppliers compete across a range of products, an apparent margin squeeze on just one or a subset of products may not harm competition.

4.28 BT does not produce disaggregated results of all individual services. In particular, the management accounts for BT Broadband aggregate results for BT Classic (512kbit/s), BT Broadband 1Mbit/s and BT Broadband Basic services. It would not therefore be possible to assess the profitability of these individual products using historical management accounts data.

4.29 Typically, the less disaggregated the level of analysis, the lower the risk that results may be distorted by cost allocation issues.

4.30 For these reasons Ofcom considers it is appropriate to apply the margin squeeze analysis to all BT’s downstream consumer broadband products considered together, rather than conducting similar analyses of individual products.

Measure of Profitability: Historical Accounting versus Discounted Cash Flow

4.31 There is no unique method for assessing whether or not a business is profitable over time. In the BSkyB case157, the OFT noted that there are at least two methods for assessing profitability over time.

“One method that would take account of the investment nature of such [capital] costs would be to calculate the present value of the net cash flows of DisCo [158], adjusted for their timing and risk (the net present value (‘NPV’) approach). Alternatively, a historical approach, which matches costs and revenues by amortising investment expenditures, could be adopted.”159

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157 Decision of the OFT under section 47 relating to Decision CA98/20/2002: alleged infringement of the Chapter II prohibition by BSkyB, 29 July 2003 (“BSkyB”).
158 ‘DisCo’ is BSkyB’s retail business.
159 BSkyB, paragraph 374.
4.32 The OFT accepted that these two approaches should theoretically give the same result over the lifetime of a project, although it noted that "no such consistency applies to an assessment of specific periods."\(^{160}\)

4.33 There are therefore a number of methods by which profitability can be measured. In this case, Ofcom considers results from three different approaches to assessing profitability:

a) historical accounting (accruals) approach;

b) an NPV approach; and

c) a 'cohort' approach.

4.34 A historical cost accounting approach assesses past profits using the actual costs and revenues of the company, as recorded in the company's accounts. This approach spreads some cash-flows forwards and backwards over time to the periods to which they relate so that income is matched with its applicable costs in any given period. This is the approach used in the preparation of profit and loss accounts under the accruals concept.

4.35 An NPV approach assesses the overall profitability of a business or investment project over the life of the business or project, and can be forward- or backward-looking (or a combination of the two). If forward looking, business plan forecasts are used; if backward-looking, actual results are used. This approach compares cash receipts with payments over time, discounting to reflect the time value of money. It is typically used by businesses when making decisions on strategic initiatives and whether to proceed with a new venture.

4.36 Cohort analysis may then be used to further inform whether products are moving into profitability. Cohort analysis takes a group of customers, first taking the service in one particular period (e.g. one month) and calculates the cost of acquiring those customers (net subscriber acquisition costs) and compares this cost to the discounted future profits from those customers. If the resulting NPV is positive, then that cohort can be regarded as profitable. If not, then the firm will not recover, for that cohort, the acquisition costs associated with that cohort (that is, they will have been unprofitable to acquire).

4.37 Under certain conditions, these different measures of profitability will give the same result; for example, where there are no changes in prices, costs or volumes over time.\(^{161}\) When conditions are changing, each of these methods provides a different perspective on the question of profitability. However, each method requires certain assumptions to be made to inform the question of profits or losses\(^{162}\), and the appropriateness of the method(s) chosen can depend on the assumptions required in the specific circumstances of the investigation (e.g. whether historical data are available).

\(^{160}\) BSkyB, paragraph 386


\(^{162}\) Ofcom notes that the concept of an accounting loss, if this is understood to mean the difference between revenues and accounting costs in a particular period, differs from that of an "economic loss". An economic loss is defined as a net reduction in wealth over a given period, and therefore also takes into account any change in the value of assets held over the period. It is possible for a firm to make an accounting loss, without necessarily also incurring an economic loss (See Annexes 4-9).
Framework for analysis of profitability

Historical analysis

4.38 As set out above, the historical cost accounting approach assesses past profits using the actual costs and revenues of the company, as recorded in the company’s accounts. The starting point for this analysis is therefore whether BT’s accounts themselves show that BT was profitable over the period.

4.39 In this case, however, Ofcom considers that certain adjustments to the historical accounting data are required in order to provide a more accurate reflection of the profitability of BT’s downstream operations during the period investigated. The cost data contained in BT’s accounts include expenditure on intangible assets, particularly subscribers, which will generate future revenues. A simple historical cost accounting approach to these costs could therefore overstate the economic value of any losses reported for those years. For this reason Ofcom considers that the historic cost data as set out in BT’s accounts are not sufficient to provide a basis for the analysis of whether a margin squeeze has taken place. Ofcom has therefore applied its own adjustments to the historical accounting data in order to ensure that the costs taken into account in the historical analysis more accurately reflect the economic value of losses incurred over the period. A full account of the adjustments made to BT’s accounts is set out in Annex 4.

NPV analysis

4.40 Ofcom has considered the extent to which it may be appropriate to conduct an NPV analysis in this case if the historical analysis shows that BT did incur losses over the period under investigation.

4.41 Ofcom recognises that a forward-looking NPV analysis is not generally used by competition authorities in their analysis of margin squeeze cases due to the uncertainty associated with the use of forecast information and its potential to offer an artificial picture of the marketplace.163

4.42 However, NPV analysis has been used in certain cases where it is considered that the historical analysis will not provide a sufficiently clear path for cost recovery over time. In Telefonica164, the European Commission concluded that it was appropriate to conduct a margin squeeze analysis under both a historical (or period-by-period) and NPV analysis “in order to avoid the finding of a margin squeeze that would be the result of accounting distortions resulting from the lack of maturity of the Spanish broadband market”.

4.43 In this case, Ofcom considers that, whilst the historical analysis is clearly of relevance in considering BT’s conduct during the period, a finding of losses on the basis of the historical analysis would not be sufficient to lead to a finding of infringement since the analysis does not take into account other considerations relevant to the assessment of a margin squeeze in the circumstances of an immature and developing market.

4.44 In reaching a conclusion as to whether or not a margin squeeze has occurred in this case, Ofcom considers it is appropriate to conduct a forward-looking NPV analysis in

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163 See, for example, Case COMP/38.233 Wanadoo Interactive, paragraphs 90-96; BSkyB at paragraphs 374-389
164 Case COMP/38.784, Wanadoo Espana vs Telefonica, Commission Decision of 04 July 2007,
addition to the historic analysis. In this respect the considerations which led the Commission to adopt such an approach in Telefonica were equally applicable to the broadband markets in the United Kingdom during the period under investigation. In particular, the lack of maturity of the downstream market may lead to accounting distortions since it may be that BT could reasonably have expected to recover any historical losses over a longer timeframe under appropriate conditions.

4.45 When a product is at an early stage of development in a fast-changing market, it may be reasonable to expect that unit costs may fall over time. This can, for example, be because fixed costs are spread over a growing number of customers (economies of scale), through savings from learning how to provide the service more efficiently (learning by doing) or through falling input costs due to technological improvements.

4.46 For expected future cost reductions to provide an argument for further economic adjustments, a necessary condition is that it is reasonable or appropriate that in a competitive market the profitability of current prices should depend on such future cost reductions. If not, then the assessment of today’s profit or loss using today’s costs would provide a true view of economic profitability and no further economic adjustment would be required. One clear set of circumstances when this would be expected to apply is in a mature market in steady state. By contrast, in an immature developing market, there may be significant scope for cost reductions over time as economies of scale, savings from learning by doing and technological improvements are realised.

4.47 For these reasons it may be considered reasonable in some circumstances to set an initial price for a product that does not cover the costs of serving early customers, but which is sustainable once expected future cost reductions are achieved (and not matched by price reductions). For example, at the time of a product launch in a new or immature market such pricing behaviour may not be unreasonable, if justified by the fast-developing or uncertain nature of future demand or cost conditions. It may be that a relatively high price, reflecting initial relatively high costs, would choke off market demand. Or it may be that future cost reductions are causally related to current behaviour, such as through economies of scale and learning by doing, which (especially in a subscription business) can provide dynamic linkages through time between customer acquisition in an earlier period and lower costs in later periods. In these circumstances, it could be reasonable for losses on customers acquired during an initial period to be offset by reasonably expected and causally related future profit on those customers in later periods and on subsequently acquired customers, within reasonable timescales and under competitive conditions.

4.48 The idea that it may be rational to price a new product at a low, even loss-making level initially in order to stimulate demand is found in the management or marketing literature, where it is sometimes described as ‘penetration pricing’ or seen as part of a ‘product life cycle’. Future cost reductions resulting from economies of scale, learning by doing and gaining customer acceptance (leading to lower marketing costs) are sometimes cited as part of the justification for such strategies. Weaknesses in such an argument, however, are that such approaches are not necessarily derived from an underlying economic theory and may not distinguish between legitimate competitive strategies and anti-competitive behaviour.

4.49 Whilst the former issue is not necessarily of great relevance in the present context, the latter certainly is. Clearly Ofcom should not permit exclusion of rivals by a dominant operator. However a dominant operator should also not be prevented from pursuing a legitimate competitive strategy. Ofcom considers that, in order to distinguish between the two, it is necessary to test whether any initial losses incurred
as part of a new product marketing strategy could be recovered under competitive conditions. Ofcom considers that the most appropriate means of doing so is by means of an NPV analysis based on forecasts of costs and revenues which reflect reasonable expectations of future cost reductions and reasonable assumptions regarding the extent to which these would be reflected in price reductions in a competitive market. A fuller explanation of the basis for Ofcom’s use of an NPV analysis and the means of assessment is included in Annex 3.

4.50 Ofcom recognises the shortcomings which may be associated with an NPV analysis due to the reliance in such cases on forecast information. Ofcom therefore considers that NPV calculations can only be relied upon to show profitability for the purposes of a margin squeeze investigation if they are based on:

a) assumptions about likely future conditions which are justified and plausible; and

b) reasonable economic and regulatory principles.

4.51 In particular, it is important to consider the period over which BT could reasonably have expected to recover any start up losses over time and the extent to which any unrecoverable losses may reasonably have been incurred by BT in order to allow it to enter the downstream market. Ofcom recognises that, in a newly developing market, there may be circumstances under which it is reasonable for certain costs not to be recovered due to the uncertainty of market conditions.

4.52 Ofcom therefore considers that it is appropriate in this case to adopt a similar approach to that adopted by the Commission in the Telefonica case by conducting its margin squeeze analysis under both a historical (or period-by-period) and NPV analysis. The characteristics which justified such an approach in that case are also present in the markets under consideration in this case; it is appropriate to ensure that accounting distortions resulting from the lack of maturity of the market do not lead to an erroneous conclusion.

4.53 In the circumstances of this case, and consistent with the approach adopted by the ECJ in the Deutsche Telekom case, Ofcom has considered the extent to which BT’s pricing strategies allowed its own downstream operations to recover their costs in order determine whether BT was operating a margin squeeze.

Assessment of Financial Data

4.54 Ofcom has conducted a detailed analysis of BT’s financial performance during the period investigated. This has involved an analysis of BT’s historical accounting data for the period investigated. Ofcom considers that in the particular circumstances of this case historical accounting data is not sufficient on its own as a basis for a finding of infringement. Accordingly, Ofcom has also analysed BT’s financial performance by means of NPV calculations to estimate the future profitability of BT’s downstream operations.

4.55 BT produced regulatory business plans throughout the period under investigation which showed consistently positive results. Ofcom has considered a number of BT’s business plans throughout the period of investigation. However, Ofcom found that BT’s analyses contained various deficiencies that made them unsuitable for the purposes of testing BT’s regulatory compliance. As set out in more detail below, Ofcom has therefore modified BT’s NPV analysis for the two major business plans prepared in December 2003 and September 2004 so as to correct for the deficiencies identified. Ofcom has chosen to rely on these two business plans, as it
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considers that these reflect the most challenging business position for BT during the period under investigation.

Historical Data Assessment

4.56 Ofcom has analysed historical accounting data relating to BT’s operations in the downstream market during the period from April 2002 to March 2005.\textsuperscript{165} A full account of Ofcom’s analysis is set out in Annex 5. The analysis shows that during the period under investigation BT sustained significant historical losses in its retail broadband business.

4.57 BT’s management accounts\textsuperscript{166} show losses during the period investigated for each set of BT’s products in the downstream market (‘BT Openworld’ and ‘BT Broadband’).

4.58 Ofcom has made a number of adjustments to the historical accounting data to give a more accurate reflection of the profitability of BT’s downstream operations during the period investigated (1 June 2002 to 31 December 2004). Those adjustments are set out in Annex 4. In summary, the main adjustments are:

4.58.1 the inclusion of certain relevant costs that are excluded from BT’s management accounts but which are captured in its regulatory accounts\textsuperscript{167} and business plans;

4.58.2 the capitalisation and amortisation of certain costs (e.g. subscriber acquisition costs) which in BT’s management accounts are written off in the period in which they are incurred; and

4.58.3 the conversion of certain costs to the appropriate cost standard for this case, namely LRIC.

4.59 The results of the various adjustments made by Ofcom are referred to as the ‘Adjusted Accounts’. Figure 4.1 below shows the effects of the principal adjustments made by Ofcom, which is to reduce the levels of losses relative to BT’s unadjusted management accounts. Figure 4.2 below summaries the principal adjustments made by Ofcom.

\textsuperscript{165} Ofcom has considered accounting data not only for the period covered by the investigation (June 2002 to December 2004) but also for the three months immediately before and after that period (April–June 2002 and January–March 2005). The reasons for extending the analysis over these periods is (a) to allow annual comparisons to be made (BT’s financial year runs from April to March); (b) to enable six-monthly and annual regulatory accounts to be used to provide reconciliation totals; and (c) to provide a better view of the underlying trends.

\textsuperscript{166} During the period of the investigation, BT produced separate management accounts for BT Openworld and BT Broadband products. Monthly management accounts for residential consumer services were prepared to assist management in running the business on a day-to-day basis.

\textsuperscript{167} As well as management accounts, BT also produced annual audited ‘regulator accounts’, the purpose of which was for BT to demonstrate compliance with its \textit{ex ante} obligations of cost orientation and non-discrimination for certain of its services and products.
4.60 The historical data shows that, over the period of investigation, BT made losses at the retail level which it did not recover over the period.

4.61 However, Ofcom considers that in the circumstances of this investigation, it would not be appropriate to rely exclusively on an analysis based on the historical accounting data to determine whether an abuse has occurred. It is not unusual for losses to be incurred by all operators in the early period of a dynamic market in the expectation of recovering such losses later. Ofcom has therefore conducted an NPV analysis of BT’s operations during the period to test whether the historical losses incurred by BT during the period of the investigation might be recoverable from causally related future profits within reasonable timescales and under competitive conditions.

**NPV Analysis**

4.62 Throughout the period investigated, BT prepared business plans on a quarterly basis to justify its pricing and investment decisions in respect of its downstream operations, which included regulatory NPV calculations. Those calculations produced consistently positive results and therefore suggested that BT’s downstream operations would prove profitable over the period considered in the plan. A detailed account of BT’s own NPV calculations throughout the period investigated is contained in Annex 5. On that basis, BT has argued that its actual past losses were not anti-competitive.

4.63 Ofcom has identified a number of concerns with BT’s cost assessment which Ofcom considers require adjustment in order for Ofcom to establish whether or not the

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168 The graph shows EBIT for both the management accounts as adjusted to include the additional regulatory accounts and also the base Case Adjusted Accounts as per the Consolidated results Model.

169 Details in Historical accounts charts.xls.
pricing policies adopted by BT would amount to an infringement of Article 102 and/or the Chapter II Prohibition. The specific concerns identified by Ofcom are:

a) First, BT’s forecasts considered profitability over a range of periods, some as long as \( [\geq] \) years. As explained in more detail at paragraphs A5.42 to A5.63 of Annex 5, Ofcom considers that BT ought reasonably to have known that it is not appropriate, in the context of a margin squeeze test, to assess the scope for recovering initial losses over such extended periods, given:

i) in particular that such periods are well in excess of the economic life of the assets involved in BT’s downstream operations;

ii) the lack of a clearly-established causal relationship between BT’s conduct in the period covered by the investigation and profits forecast to be received so many years later; and

iii) the increased risks of forecasting error and of including the rewards of any anticompetitive behaviour over the longer term.

b) Second, BT forecasts increasing service margins over the life of the business plans. BT’s calculations were based on an assumption that unit costs would fall in the future but that unit revenues would remain static (or would increase slightly),\(^\text{170}\) with the consequence that service margins (i.e. ongoing revenues less ongoing costs) were forecast to be significantly higher than the actual historical margins achieved in the period covered by the investigation. As explained at paragraphs A5.64 to A5.92 of Annex 5, Ofcom considers that there are good reasons to believe that BT’s assumptions of increasing service margins are unjustified and/or implausible. In particular, service margins at the forecast levels would be unlikely to prove sustainable under competitive conditions and are inconsistent with comparable forecasts made at the time by other similarly situated ISPs.

c) Third, BT’s calculations unreasonably omitted certain costs relevant for present purposes; and overstated other costs as explained in more detail at Annex 5.

d) Fourth, BT’s business plans were based on unreasonably low forecasts of the rates at which customers would leave BT (‘churn rates’)\(^\text{171}\) and of the average period for which customers were expected to remain with BT (‘customer lives’ or ‘customer lifetimes’). As explained in more detail at Annex 6, Ofcom considers that BT’s assumptions concerning churn rates and customer lives were, in some cases, unjustified and/or implausible. In some cases, BT’s forecasts were based on churn rates which implied customer lifetimes extending for as long as \( [\geq] \) years.\(^\text{172}\) Such predictions contradicted evidence of past performance available to BT at the time, and what could be considered to be reasonable expectations.

4.64 In its own calculations of NPV in this case, Ofcom has based its analysis on business plans prepared by BT in December 2003 and September 2004. In light of the shortcomings Ofcom has identified in those business plans, Ofcom has made

\(^{170}\) The assumed increase in unit revenues was based on the revenues expected to result from the introduction of additional payments from subscribers exceeding their download thresholds.

\(^{171}\) Churn rates are used to describe the number of subscribers who cease being customers in a particular period. The churn rate is usually stated as the number of subscribers who cease taking a service during the period expressed as a percentage of the number of subscribers at the beginning of the period.

\(^{172}\) The average customer life is related to the churn rate by the formula:

\[
\text{Average customer life} = \frac{-1}{\ln(1 - \text{churn rate})}.
\]
adjustments, as set out in Annexes 6 to 9, in order to derive an NPV figure which it
cconsiders to be more reflective of reasonable assumptions. In doing so, Ofcom has
reflected its view that the key issue in determining profitability on the basis of an NPV
analysis is to ensure the reasonableness of the assumptions underlying the analysis.
In particular, Ofcom considers in this case that the assumptions on which an NPV
analysis must be such that an equally efficient operator would consider that, on the
basis of those assumptions, entry to the market would represent a reasonable
investment opportunity over time.

Provisional NPV results

4.65 Ofcom provisionally found, on the basis of the evidence before it, that the NPV
outcomes would be negative for a range of scenarios, as shown in Figures 4.3 and
4.4 below. The implication of this analysis was that the losses could not reasonably
be expected to be recovered from future profits under competitive conditions.

Figure 4.3: BT’s December 2003 Plan: Ofcom calculated NPV (using Ofcom
“reasonable” churn rates)

<table>
<thead>
<tr>
<th>Period for NPV calculation (years)</th>
<th>£m</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>02/03</td>
</tr>
<tr>
<td>Without Contestability</td>
<td>![chart]</td>
</tr>
<tr>
<td>Period before contestability</td>
<td>![chart]</td>
</tr>
<tr>
<td>applies to service margins</td>
<td>![chart]</td>
</tr>
<tr>
<td>3 years (04/05)</td>
<td>![chart]</td>
</tr>
<tr>
<td>4 years (05/06)</td>
<td>![chart]</td>
</tr>
<tr>
<td>5 years (06/07)</td>
<td>![chart]</td>
</tr>
<tr>
<td>6 years (07/08)</td>
<td>![chart]</td>
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<tr>
<td>7 years (08/09)</td>
<td>![chart]</td>
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</tbody>
</table>

Figure 4.4: BT’s September 2004 Plan: Ofcom calculated NPV (using Ofcom
reasonable churn rates)

<table>
<thead>
<tr>
<th>Period for NPV calculation (years)</th>
<th>£m</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>02/03</td>
</tr>
<tr>
<td>Without Contestability</td>
<td>![chart]</td>
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<tr>
<td>Period before contestability</td>
<td>![chart]</td>
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<tr>
<td>applies to service margins</td>
<td>![chart]</td>
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<tr>
<td>4 years (05/06)</td>
<td>![chart]</td>
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<tr>
<td>5 years (06/07)</td>
<td>![chart]</td>
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<tr>
<td>6 years</td>
<td>![chart]</td>
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</table>
BT’s submissions

4.66 BT subsequently provided additional financial information and made additional submissions in response to Ofcom’s provisional findings. BT’s overall view was that Ofcom’s approach was to identify assumptions within BT’s business plans that, with the benefit of hindsight, appear to Ofcom to be over-optimistic, and to adjust these downwards. BT stated that at no stage have any adjustments been made upwards by Ofcom to allow for assumptions which were overly conservative. BT submitted this to be wholly inappropriate and an unfair approach to assessing the reasonableness of the business plan as a whole.

4.67 BT went on to identify five adjustments or approaches that Ofcom used when carrying out its analysis and set out why it considered such adjustments to be inappropriate. BT also set out the impact of those adjustments on the NPV calculations, based on the contestability scenarios being held at the four year point.

4.68 In summary, Figure 4.5 below shows BT’s estimate of the cumulative impact of its adjustments.

**Figure 4.5: BT estimate of NPV following adjustments**

<table>
<thead>
<tr>
<th>Adjustment</th>
<th>Dec 03 plan</th>
<th>Sep 04 plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>NPV as per Ofcom adjusted model</td>
<td>(-£[&gt;]&lt;m)</td>
<td>(-£[&gt;]&lt;m)</td>
</tr>
<tr>
<td>Contestability after 6 years</td>
<td>+£[&gt;]&lt;m</td>
<td>+£[&gt;]&lt;m</td>
</tr>
<tr>
<td>Regulatory costs on “conceivably” available information (and % of SGA, rather than total costs)</td>
<td>+£[&gt;]&lt;m</td>
<td>+£[&gt;]&lt;m</td>
</tr>
<tr>
<td>Adjust for Ofcom overstatement of churn</td>
<td>+£[&gt;]&lt;m</td>
<td>+£[&gt;]&lt;m</td>
</tr>
<tr>
<td>Treatment of pre-2004 losses</td>
<td>+£[&gt;]&lt;m</td>
<td>+£[&gt;]&lt;m</td>
</tr>
<tr>
<td>Adjust for Market based terminal value</td>
<td>+£[&gt;]&lt;m</td>
<td>+£[&gt;]&lt;m</td>
</tr>
<tr>
<td>Total NPV</td>
<td>+£[&gt;]&lt;m</td>
<td>+£[&gt;]&lt;m</td>
</tr>
</tbody>
</table>

4.69 The main points raised by BT in its submissions were as follows.

**Additional Relevant Costs**

4.70 As set out above, Ofcom considers that there are “other relevant costs” in the regulatory accounts that should be added to BT’s management accounts to reflect the true costs of the broadband business.

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174 Ofcom’s six-year cut-off, four year contestability and “reasonable” churn scenario.
4.71 BT submitted that Ofcom significantly overstated the actual level of such costs, such that Ofcom had significantly overestimated the level of costs being incurred by the business.

4.72 Further, BT considered that the magnitude of these costs was not known at the time the business plans were produced and that it is unreasonable to assume they could have been known. BT suggested that it would be more reasonable to assume that these costs would be incurred at a rate which was more in line with the significantly lower levels experienced during the early years of the business. Therefore BT proposed that “other relevant costs” should be added to the business plan in line with the levels incurred in the very early years of the business and not in line with the rate they were actually incurring them at the time the business plans were being drawn up.

4.73 Based on BT’s calculations, this approach would increase the NPV analysis by £[\text{\textsterling}] million and £[\text{\textsterling}] million for the December 2003 and September 2004 business plan respectively.

**Churn**

4.74 Ofcom considered that BT’s business plans contained over-optimistic assumptions regarding churn rates and reduced those rates accordingly.

4.75 BT considered that, based on actual observed churn data from the December 2004 subscriber base, the churn rates BT had assumed in its original business plans were justified and wholly reasonable. Further, BT also referenced arguments (largely based on trends observed in utility businesses) that, over time, churn rates associated with subscribers will decline, since the propensity to churn is observed to decline significantly as a customer’s tenure increases.

4.76 This increases the NPV analysis by £[\text{\textsterling}] million and £[\text{\textsterling}] million for the December 2003 and September 2004 business plan respectively.

**Contestability**

4.77 Ofcom considered that in a competitive market, service margins would be unlikely to expand continuously as competitive forces would serve to restrict future margins. Ofcom’s approach was to limit service margin expansion through use of a broad range of scenarios which served to restrict service margin expansion beyond a range of points in time (i.e. after four years, five years, six years, and so on).

4.78 BT submitted that it would be reasonable to assume service margins will increase over at least the first six years of the business and that applying constant service margins before this point would be unreasonable. BT further observed that, comparing an NPV analysis that applied contestability after four years with one that applied contestability after six years, the impact on the NPV is £[\text{\textsterling}] million and £[\text{\textsterling}] million for the December 2003 and September 2004 business plan respectively.

**Losses incurred prior to the period of alleged abuse**

4.79 Ofcom’s NPV analysis of BT’s business plans in its provisional finding commenced from the start of BT’s broadband business in 2002. It therefore incorporated all losses incurred prior to the period of alleged abuse (i.e. during the period 2002 – 2003).
4.80 BT submitted that these costs and revenues were irrelevant to the analysis on the grounds that Ofcom had provisionally concluded that there was no infringement before 2004. BT suggested that the correct approach was to exclude all of the historic and future costs and revenues for the subscribers acquired prior to the period of alleged abuse.

4.81 The impact of BT’s adjustment would increase the NPV analysis by £[<] million and £[<] million for the December 2003 and September 2004 business plan respectively.

**Terminal values**

4.82 Ofcom shortened the period over which it assumed that BT would recover historic losses, considering that the period covered by the business plan was inappropriate for the purposes of a Competition Act analysis. At the same time Ofcom introduced into the analysis a value for BT retail broadband subscribers *in situ* at the end of the period, referred to as the “terminal value”. This reflects the future value to the business of those subscribers and therefore provides some offset against historic losses. Ofcom had estimated the terminal value using a cost-based approach which linked the future value obtained from a customer to the initial amount paid to acquire a customer.

4.83 BT submitted that cost-based approaches such as this are appropriate to value single tangible fixed assets such as plant and machinery but are not appropriate for use when considering the value of complex “assets” such as a subscriber base which may incorporate a significant amount of intangible (and non cost-based) value. BT therefore submitted that Ofcom’s approach underestimated the appropriate terminal value by excluding consideration of such intangible value which may attach to the subscriber base. In doing so, BT considered that Ofcom understated the ability of BT to recover its losses, understating the NPV of the business plan, because the value of the subscriber base was higher than the cost base alone would imply.

4.84 BT argued that a more appropriate approach to estimating the future value of a customer would be to consider market based evidence of the valuation of ISP businesses. This argument is predicated upon the idea that such valuations crystallise all value attached to the subscriber base. By dividing the amount paid for an ISP business by its number of broadband subscribers, a valuation of a subscriber can be ascertained and by multiplying such estimates by the number of subscribers BT forecast it would have obtained by the end of the period, BT submitted that a more realistic indication of the expected future profit generation from these subscribers could be obtained. BT used a number of examples of such transactions to demonstrate its estimate of an appropriate “per subscriber” value based on this methodology.

4.85 This method, BT submitted, revealed the expected future profit streams which would accrue from existing broadband subscribers. Indeed, had BT “sold” its subscribers for such values during the period, it would have been deemed to have made a profit on its original investments.

4.86 The impact of BT’s adjusting the NPV analysis to include a market based terminal value calculated in line with the proposed methodology increases the NPV analysis by £[<] million and £[<] million for the December 2003 and September 2004 business plan respectively. The NPV stated a result for this given sensitivity of -£[<] million and -£[<] million for the December 2003 and September 2004 business plan respectively.
Ofcom’s consideration of BT’s submissions

4.87 Ofcom has considered the points raised by BT and has concluded that further adjustments are required to both the historic analysis and the NPV analyses which it has carried out during the investigation. The additional adjustments which Ofcom has made in respect of the historic analysis have given rise to minor changes in the amount of losses which may be identified at the downstream level. The historic analysis continues to show that BT’s downstream operations incurred losses throughout the period of investigation. However, Ofcom recognises the validity of certain of the points raised by BT and has revised its NPV analysis as set out in more detail below.

Additional relevant costs

4.88 Ofcom used BT’s monthly management accounts as a starting point for its Adjusted Accounts analysis and included an analysis of BT’s reconciliation to the more complete regulatory financial statements.

4.89 The reconciliations between the management and regulatory accounts identified significant costs in the regulatory accounts relevant to the margin squeeze analysis which were not included in the management accounts – the “additional relevant costs”. The Adjusted Accounts analysis in Ofcom’s provisional finding was based on the interim regulatory accounts to September 2004, (the most recent available at time the analysis was carried out). This analysis also included an Ofcom estimate of additional relevant costs for the remainder of the 2004/5 financial year. This estimate was also used in the estimate of additional relevant costs included in the NPV analysis.

4.90 BT indicated that, based on a full year reconciliation of management accounts to regulatory accounts, the level of actual additional relevant costs for 2004/5 was significantly lower than previously estimated by Ofcom (££[>]<] million compared to ££[>]<] million). Ofcom has subsequently undertaken a significant amount of additional analysis on the 2004/5 accounts and reconciliation.

4.91 Ofcom considers that the previous estimate overstated the level of additional relevant costs in both the Adjusted Accounts for 2004/5 and also the NPV analysis of the September 2004 Business Plan.

4.92 Ofcom’s conclusion is based on the following factors:

- The interim regulatory accounts are not produced to a rigorous standard (i.e. they are not audited) and many interim cost allocations are based on prior year apportionments which are revised in the full year accounts. For new, or rapidly growing services (such as broadband), this means that the interim accounts will contain significant differences to the final costs that are allocated for those services for the first six months.

- BT changed the accounting method for the most important additional relevant cost (call centre costs) identified in the interim reconciliation. Ofcom has further verified this method and considers that the revised approach corrects a previous error.

- Ofcom had made a number of assumptions in its provisional finding about the type and nature of additional relevant costs. These, together with the inclusion of the call centre costs, led Ofcom to consider that the additional call centre costs
were largely variable in nature. However, based on BT’s response and a further
detailed review of the nature of those costs, Ofcom now considers that they are
largely fixed in nature. This new approach has a significant impact how future
additional relevant costs are estimated in the NPV analysis.

4.93 Ofcom’s revised calculation of additional relevant costs for 2004/5 is £[]> million
which compares to £[>] million of additional relevant costs included in the
provisional finding.

Churn

4.94 Having considered the available evidence and, in particular, BT’s actual churn rates
received in BT’s additional submissions, Ofcom has revised its assumptions on churn
rates in the analysis. The revised cohort analysis also takes account of the 12 month
“spike” in churn. Ofcom’s approach to churn rates is set out in more detail in Annex 6.

4.95 The effect of Ofcom’s revised approach to churn rates, on each set of revised
assumptions, has the effect of reducing the losses identified in the NPV analysis by
approximately £[>] million.

Contestability

4.96 Ofcom’s approach to contestability adjustments was to consider a broad range of
possibilities in respect of contestability adjustments, whilst using an analysis of
break-even margins to indicate the scenarios on which more weight should be
placed, because of their consistency with a competitive market. Ofcom does not
consider that BT’s submissions change this approach. However, in addition to break-
even margins, Ofcom has also included as a further benchmark BT’s actual service
margins (including those achieved after the dates of the business plans).

Losses incurred prior to the period of alleged abuse

4.97 BT submitted that Ofcom should exclude all costs incurred prior to 1 January 2004
(the start of the period of alleged anti-competitive behaviour) and also all future costs
and revenues associated with subscribers acquired prior to 1 January 2004. BT
argued that, as a result of the Director’s Decision, that prior to that date BT was not
acting anti-competitively, the assessment of BT’s behaviour after 1 January 2004
should not depend on any activities prior to that date.

4.98 Ofcom recognises that it may not be appropriate to include all costs associated with
subscribers acquired prior to 1 January 2004 in the NPV analysis. Ofcom does not
accept that this means that all costs incurred prior to 1 January 2004 should be
excluded. To the extent that BT’s activities prior to 1 January 2004 generated
intangible assets with an ongoing benefit, then the value of these assets should also
be included in the assessment of BT’s conduct after 1 January 2004, otherwise the
assessment of profitability would not include all relevant costs which BT’s
competitors might have to incur in order to compete.

4.99 The question then arises as to how the subscribers in situ at 1 January 2004 should
be valued, and also whether any other assets (in particular intangible assets) should
be included in our assessment of profits after 1 January 2004.

4.100 Consistent with Ofcom’s approach to NPV more generally, as set out at paragraphs
4.40 to 4.53 above, Ofcom considers that the relevant approach for determining the
value of subscribers in place at 1 January 2004 is one derived from an equally
efficient operator test. Applying this test implies that the appropriate value for subscribers is what it would cost an equally efficient operator to acquire a subscriber base similar to BT’s as well as any intangible assets that may have existed at 1 January 2004.

4.101 For an equally efficient operator, the costs to acquire subscribers and intangible assets will be the replacement cost or Modern Equivalent Asset (“MEA”), as this measures the cost to an equally efficient operator of ‘replicating’ BT’s subscriber base and intangible assets, as at 1 January 2004.

4.102 Ofcom has revised its NPV calculations, commencing on 1 January 2004, and therefore values the opening subscriber base at MEA. Ofcom notes that in 2003/2004 the cost of acquiring subscribers was generally falling. This means that the MEA as at 1 January 2004 will be lower than the historic cost. It is therefore appropriate to value subscribers at 1 January 2004 not on an actual historic cost basis but rather their replacement value (MEA) as at 1 January 2004.\textsuperscript{175}

4.103 The issues of asset valuation (how to calculate an appropriate opening value) are the same as those for a terminal value as discussed above.

4.104 Ofcom has not included all intangibles in this analysis. However, as discussed above, given that the revised approach to cost recovery truncates the NPV analysis at both the beginning (where assets are treated as a cost) and at the end of the period (where assets are treated as a revenue), the risks of failing to include the correct value of intangible assets are arguably significantly reduced because, to some degree at least, the two valuations are netted off. Ofcom has therefore included the value of subscribers and intangible assets as a cost at the start of the NPV calculation on 1 January 2004.

4.105 In summary, Ofcom considers it is appropriate to make changes to the treatment of costs prior to 2004 as follows:

- exclude all of the significantly negative cash flows during 2002/3 – 2003/4 associated with those subscribers which were acquired and churned in the period;
- exclude the negative service margin of all subscribers acquired at the beginning of 2002/3 and those acquired during 2002/3 to 2003/4;
- for those subscribers acquired before 2004, include an opening value as at 1 April 2004 at ‘replacement’ cost, i.e. MEA instead of the (amortised) historic cost of acquisition.

**Terminal values**

4.106 In the Adjusted NPV analysis, Ofcom considered the NPV after setting the period of the NPV analysis for a period of up to nine years in order to:

- Minimise the likelihood of forecasting errors; and

\textsuperscript{175} The MEA approach adjusts for the change in asset prices over time. Thus an asset with an historic cost of, say, £100 and a current cost (or replacement) of £60 would require an adjustment (or revaluation) of £40 to convert asset values from an historic to an MEA basis.
Minimise the risk that the profit calculation includes the rewards of the anti-competitive behaviour in future periods which could lead to a false test result (e.g. if overall profitability was only due to the inclusion of future profits attributable to a higher market share or a higher price/value per subscriber than BT would have secured in a competitive market).

4.107 Ofcom recognised the need to include a terminal value to reflect the value of any assets remaining at the truncation date. Ofcom therefore included a terminal value based on the unamortised cost of acquiring the volume of subscribers at the truncation date (plus any unamortised fixed assets and development expenditure). Such an approach avoided the potential problem of building the reward from anti-competitive behaviour into the terminal value, thereby leading to a false test result. Ofcom noted that, to the extent that the current cost of an asset was significantly different to the historic cost, it may be appropriate to use a replacement cost to value the assets rather than the historic costs (amortised using the subscriber churn rate).

4.108 BT argued that this was an inappropriate approach to calculating a terminal value and that if a terminal value was to be used then it should be based on market values for broadband ISPs on the basis that these better reflect the value of the business at the truncation date. In particular, BT argued that Ofcom's approach ignored the value of intangible assets developed during the start up phase of a business such as experience, economies of scale, and know-how.

4.109 Ofcom recognises that its approach to calculating terminal values did not take into account the value of intangible assets at the truncation date, and as a result could be argued to understated the economic value of the business, were significant intangible assets found to exist.

4.110 However, Ofcom has the following concerns in using market-based values to calculate the terminal value in a competition analysis:

- On a practical level, for market values to be relevant they need to relate to comparable companies. This typically requires significant adjustments to take account of differences between the benchmark company and the business it is being applied to. Adjustments are required to take account of differences in types of services offered (e.g. business vs. residential), profitability, type of assets; productivity etc. These differences can be very significant and account for the very wide range in observed market valuations of ISPs. Determining an appropriate benchmark market value for BT's broadband business is therefore far from straightforward.

- In principle, a market-based value could give a useful insight into the value of intangible assets (i.e. the difference between a cost-based value of assets and the market value of the business could be attributable to intangible assets). However, such an approach to calculating intangible assets would require robust comparable market values to be identified. BT failed to provide this and Ofcom's analysis suggests a wide range of market values.

4.111 Ofcom has considered the extent to which the market-based and cost-based terminal values could be reconciled for the purposes of its NPV analysis in this case. If Ofcom's previous estimate of subscriber terminal values omitted an appropriate valuation for intangible assets, an alternative to market based values in valuing intangible assets would be to apply a cost based approach to any identified intangible assets. The difficulty in applying this approach is to identify which costs generate intangible assets. The Competition Commission applied this approach in profitability.
analyses in its inquiries into both the Supply of Banking Services to Small and Medium Sized Enterprises\textsuperscript{176} and Home Credit\textsuperscript{177} investigations and set out criteria on which to estimate the cost based value of intangible assets, which Ofcom has applied.

4.112 The Competition Commission set out the following principles to be applied when considering whether revenue costs should be capitalised and hence a return on them be allowed in profitability analysis:

a) whether the expenditure on any given intangible should be capitalised will depend on the nature of the specific intangible identified and the context; and

b) if the revenue cost of a specific identified intangible is to be capitalised for the purposes of [the CC’s] inquiry, it must meet three conditions:

i) it must comprise a cost incurred now, primarily to obtain earnings in the future;

ii) this cost must be additional to those necessarily incurred at the time in running the business; and

iii) it must be identifiable as creating such an asset separate from any that arises from the general running of the business.

4.113 Ofcom has explicitly considered the criteria set out by the Competition Commission for identifying and valuing intangible assets. Ofcom’s application of this methodology has suggested that the identifiable intangible assets in this case were negligible.\textsuperscript{178}

4.114 Taking into account these factors and, in the circumstances of this case, Ofcom has truncated the NPV calculation at both the start and end of the period investigated. In doing so, Ofcom valued the opening and closing subscribers using a cost-based MEA method. This method effectively excludes the value of intangible assets from the beginning of the NPV calculation (when it would be included as a cost in the opening value), but also from the end (when it would be included as a net revenue in the terminal value). This approach therefore arguably minimises the risk of incorrectly valuing the intangible assets created by BT. The existence of both opening and terminal values significantly reduces the sensitivity of the NPV results to changes in the method used, as long as the same method is used for both opening and terminal values. For example, use of market-based values would worsen the NPV by increasing the opening value, but improve it by increasing the terminal value, and the overall effect could go either way.

4.115 Ofcom’s approach to the assessment of terminal value is set out in more detail in Annex 7.

**Ofcom’s revised NPV analysis**

4.116 The full detail of Ofcom’s NPV analysis is set out at Annex 5. Ofcom considers that it is appropriate for the period prior to 1 January 2004 to be treated differently to the

\textsuperscript{176} \url{http://www.competition-commission.org.uk/rep_pub/reports/2002/fulltext/462c2.pdf} (at paragraph 2.271, page 69)

\textsuperscript{177} \url{http://www.competition-commission.org.uk/rep_pub/reports/2006/fulltext/517.pdf} (at paragraphs 3.109 to 3.111)

\textsuperscript{178} The categories of identifiable assets are similar categories to those in the SME banking and Home Credit Enquiry reports.
subsequent period for the purposes of the NPV analysis. The reasons for this approach are set out below.179

4.117 During 2002 and 2003, the emerging consumer broadband market involved newly developing services in a dynamic and rapidly evolving market. There was a high level of uncertainty surrounding key profit drivers such as future growth, costs, pricing models and product design. For example, at the time BT was formulating its business plans, there would have been considerable uncertainty around factors such as churn rates and future terminal value of the subscriber base.

4.118 Further, Ofcom recognises that the assessment of NPV relies on a number of assumptions, and small changes in those assumptions may give rise to a major change in the outcome of the NPV analysis. In this context it is important to note that BT could not have been aware of the exact nature of Ofcom’s preferred test until November 2003. However, Ofcom notes that when BT first launched the products in question, it did so on the basis of a business plan which was found to be compatible with the competition rules in the Director’s Decision.

4.119 Ofcom has therefore conducted two sets of NPV analysis, the first beginning on 1 June 2002 and the second from 1 January 2004180.

Analysis from 1 June 2002

4.120 Ofcom has considered the extent to which an NPV analysis commencing on 1 June 2002 would demonstrate that BT would have recovered its losses over a reasonable period. In conducting its analysis, Ofcom has taken BT’s business plans as the starting point for its analysis. Those business plans show that BT considered that, over the period under investigation taken as a whole, it could have been expected to trade profitably. However, as set out above, Ofcom does not consider that those business plans are based upon reasonable assumptions and Ofcom has therefore applied the adjustments set out in Annex 5 in its own analysis of NPV.

4.121 Ofcom’s provisional view was that, on the basis of the inputs and assumptions used in its analysis, BT could not reasonably have expected to recover any losses incurred over a reasonable timeframe. In light of BT’s submissions, Ofcom has revised its NPV analysis. The results of the revised analysis are set out in Figures 4.6 and 4.7 below.

Figure 4.6: Results of NPV analysis from June 2002 (December 2003 plan)

[図]

Figure 4.7: Results of NPV analysis from June 2002 (September 2004 plan)

[図]

4.122 Ofcom’s revised NPV analysis shows that, over the period 1 June 2002 to 31 December 2003, BT may have been expected to incur irrecoverable losses.

179 Ofcom has previously indicated that these factors were relevant to the consideration of whether or not BT’s conduct could be objectively justified. However, Ofcom is now of the view that those considerations are relevant to the substantive analysis rather than any objective justification.

180 In doing so, Ofcom has taken into account adjustments which need to be made to the analysis to take account of the treatment of pre-2004 losses identified above.
Analysis from 1 January 2004

4.123  As set out in Figures 4.8 and 4.9 below, Ofcom’s revised NPV analysis commencing on 1 January 2004 shows that BT’s downstream operations could, from 1 January 2004 onwards, have been expected to make profits in a number of plausible and reasonable scenarios. Under other scenarios, losses are observed but these are small relative to revenues so that only relatively small variations in revenues and/or costs would result in breakeven for the businesses in question.

Figure 4.8: NPV results over a range of NPV periods and the contestability scenarios - December 2003 business plan

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<tr>
<th>£m</th>
<th>Period for NPV calculation (years)</th>
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<tbody>
<tr>
<td></td>
<td>04/05</td>
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<tr>
<td>Years since launch</td>
<td>3</td>
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<tr>
<td>Years of Plan</td>
<td>1</td>
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<tr>
<td>Without Contestability</td>
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<tr>
<td>Period from launch before contestability applies to service margins</td>
<td>4 years (05/06)</td>
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<td>7 years (08/09)</td>
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Figure 4.9: NPV results over a range of NPV periods and the contestability scenarios - September 2004 business plan

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<td>8 years (09/10)</td>
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<td>9 years (10/11)</td>
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4.124  Ofcom’s NPV analysis for the period shows that BT could, from 1 January 2004 onwards, have been expected to make profits in a number of plausible and reasonable scenarios. Ofcom therefore considers that it would not be appropriate to make a finding of infringement for the period 1 January 2004 forwards.

Sensitivity analysis

4.125  Ofcom’s NPV analysis commencing on 1 June 2002 produces consistently negative results. However, as set out at paragraphs 4.116 to 4.119 above, Ofcom recognises that, prior to 1 January 2004, the consumer broadband market was rapidly evolving
and BT would not have been aware at that time what Ofcom’s preferred approach to any NPV analysis might be. In light of those considerations in particular, Ofcom has therefore considered the extent to which the evidence before it in relation to the pre-January 2004 period is sufficient to make a finding of infringement.

4.126 In considering this question, Ofcom is conscious that any evidence which is put forward to support a finding of abuse must be strong and compelling. In this context, Ofcom also recognises that the assessment of a margin squeeze necessarily involves complex economic and accounting assessments which by their very nature are open to differing views as to reasonableness. Taking these considerations into account, Ofcom has conducted a sensitivity analysis to test the robustness of its findings in relation to this period. The results of that analysis are set out in detail in Annex 9.

4.127 Ofcom’s sensitivity analysis has considered the effect of alternative assumptions in respect of two key variables: churn and terminal value.

4.128 Ofcom’s test relies on Ofcom’s view of a reasonable churn assumption (referred to as ‘Ofcom’s reasonable churn rate’). However, Ofcom recognises that, at the time BT was formulating its business plans, there would have been considerable uncertainty about this view. Ofcom considers that an appropriate sensitivity to apply is to use churn forecasts closer to those made by BT that would have been viewed to fall within the range of plausible forecasts at that time in order to test the robustness of the financial analysis.

4.129 Ofcom’s test included a terminal value which reflects assumptions made by Ofcom about the value of BT’s customer base at the end of the period considered in the NPV calculation. Ofcom derived its estimates of the value of the customer base from an assessment of BT’s forecast costs. However, as explained in paragraph 4.118, Ofcom considers that there was legitimate scope for doubt by BT in this early period as to the exact NPV methodology to be applied. In particular, BT might reasonably have based its forecast of the value of the customer base on the costs of acquisitions that it incurred during the period June 2002 to December 2003.

4.130 In testing the robustness of the NPV calculations, Ofcom’s sensitivity analysis therefore takes account of the fact that the cost of subscriber acquisitions itself fell significantly between 2002 and 2003, and continued to fall in the period from 2004 onwards. In addition, there was considerable volatility in the level of acquisition costs from month to month. In order to strike an appropriate balance between avoiding distortions caused by unusually high or low figures in a particular month, Ofcom has taken an average over the three month period immediately preceding January 2004 as the basis for its estimate of terminal value. As set out in more detail in Annex 9. Ofcom considers that a terminal value of £[✓] per subscriber is appropriate in this case.

4.131 Ofcom’s sensitivity analysis also extends the potential payback period. As noted earlier, Ofcom accepts that where new products are introduced to the market, there may be rational strategies for firms to incur start-up losses with the expectation of recovering these in later periods. This consideration seems relevant to the consumer broadband market, where consumers arguably had limited experience or awareness of the benefits of broadband initially, and where significant expenditure on marketing and subsidising upfront costs were undertaken by all large ISPs to gain mass market subscribers. Taking this into account, Ofcom has looked at NPV for a period of up to four and five years (from 1 January 2004).
4.132 In Ofcom’s NPV analysis excluding pre-2004 losses, Ofcom considered that it was plausible for BT to have forecast increasing service margins up to –two to three years from the start of the relevant forecast period, with service margins capped from that point onward. However, Ofcom recognises that in relation to its approach to forecasting service margins, BT could reasonably have taken a different approach prior to becoming aware of Ofcom’s position on this. Ofcom has therefore considered whether BT might reasonably have made more optimistic assumptions concerning what service margins would be achievable in a competitive market.

4.133 Figures 4.10 and 4.11 illustrate the impact on the NPV analysis of adopting the following assumptions:

4.133.1 A monthly churn rate of [>]%
4.133.2 A terminal value of £[>] per subscriber
4.133.3 Payback periods of up to five years (from 1 January 2004)
4.133.4 Service margin increase year on year up to four and five years (from 1 January 2004).

Figure 4.10: Sensitivity Analysis: December 2003 plan

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<th>Period for NPV calculation (years)</th>
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Figure 4.11: Sensitivity Analysis: September 2004 plan.

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4.134 In testing the robustness of the NPV calculations, and as shown in Figures 4.10 and 4.11 above, Ofcom’s sensitivity analysis shows that, if the NPV period is extended up to seven years (five years from when the business plan was produced), and if
sensitivities in respect of churn forecasts and terminal value are applied, the NPV result becomes positive for a range of plausible contestability scenarios.

4.135 The conclusion of Ofcom's sensitivity analysis is that the finding that BT's activities at this time could have been expected to lead to irrecoverable losses is not robust to changes in assumptions. In particular, relatively small changes to assumptions about churn rates, payback period, contestability and terminal value to levels which BT might reasonably have regarded as credible at that time, could lead to a positive NPV.

Conclusions on abuse

4.136 Ofcom is not satisfied that the results of its own NPV analyses provide sufficiently strong and compelling evidence of an abusive margin squeeze. Ofcom’s sensitivity analysis shows that, under certain assumptions which BT might have regarded as reasonable at that time, an NPV analysis commencing on 1 June 2002 might have produced positive results. Taking into account the uncertainties associated with a rapidly developing market and the fact that BT could not have been aware of the approach which Ofcom would take to the NPV analysis until November 2003, this suggests that the negative NPV analysis seen from 1 June 2002 cannot be relied upon to support a finding that BT abused a dominant position. The NPV analysis from 1 January 2004 is positive and therefore demonstrates that, from this time, BT was not engaging in a margin squeeze at all.

4.137 In those circumstances, Ofcom does not consider that there is sufficient evidence before it to conclude that BT has infringed the Chapter II Prohibition and/or Article 102 TFEU in this case.

4.138 Given Ofcom’s final conclusion that the evidence does not support a finding that BT engaged in abusive conduct during the period investigated, it is unnecessary to consider further whether BT’s conduct had any actual or potential effects on competition. Accordingly Ofcom has not proceeded to examine any effect on competition in this Decision.

DAVID STEWART

2 November 2010
Annex 1

Critical loss calculations

Formula

A1.1 The critical loss (“I”) is calculated as \( \frac{i}{1 + i - \alpha} \) where “I” is the SSNIP (which Ofcom assumes to be 10%) and ‘\( \alpha \)’ is the ratio of the marginal cost to the current price (i.e. the price before the SSNIP).

A1.2 The critical loss is the percentage reduction in demand for which the SSNIP leaves profits unaffected. So a larger loss of demand than the critical loss makes the SSNIP unprofitable.

A1.3 The formula for the critical loss is derived as follows. The change in profit equals the change in revenue less the marginal costs saved (assuming constant marginal cost, \( mc \)):

a) \( \Pi_1 - \Pi_0 = p_1q_1 - p_0q_0 - mc(q_1 - q_0) \)

where ‘\( \Pi \)’ is profit, ‘\( mc \)’ is marginal cost, ‘\( p \)’ is price, ‘\( q \)’ is quantity and subscripts 0 and 1 indicate before and after the SSNIP

\( p_1 = p_0(1 + i) \) where “I” is the size of the SSNIP

\( q_1 = q_0(1 + l) \) where \( l < 0 \) is the percentage loss of demand

\( mc = \alpha p_0 \) i.e. ‘\( \alpha \)’ is the ratio of marginal cost to the initial price

b) Substituting these definitions in (1), specifying \( \Pi_1 - \Pi_0 = 0 \), and rearranging gives the critical loss:

\( l = -\frac{i}{1 + i - \alpha} \)

Examples

A1.4 The following example illustrates how the critical loss value increases as the ratio of the marginal cost to the original price increases.

Assume \( i = 10\% \)

a) \( mc = 0\% \times p_0 \) implies \( l = -9.1\% \)

b) \( mc = 50\% \times p_0 \) implies \( l = -16.7\% \)

c) \( mc = 60\% \times p_0 \) implies \( l = -20\% \)

d) \( mc = 70\% \times p_0 \) implies \( l = -25\% \)
Actual critical loss calculation

A1.5 Ofcom uses the following critical loss value calculation to determine whether a SSNIP on the price of broadband would be profitable for a hypothetical monopolist (see paragraph 2.129).

Retail

a) \( i = 10\% \)

b) \( mc = £15.27 \) per month (including VAT), based on standard charging for IPStream Home 500 (as at August 2004)

c) \( p = £25 \) per month (including VAT), based on an indicative monthly rental charge (at August 2004).
Annex 2

Indirect constraints: adjusting market shares

Market Shares

A2.1 As set out in paragraph 3.26, a measure of BT’s market share of sales by operators which supply third parties at the wholesale level (‘direct constraints’) only tends to overstate BT’s market power. Ofcom therefore believes that sources of indirect constraints (that is, from operators competing at the retail level but not necessarily supplying wholesale services to other operators) should be taken into account in calculating wholesale market shares. Such constraints are subject to a ‘dilution effect’ because a given percentage increase in the wholesale charge will, if passed through, be reflected in a smaller percentage increase in the retail price. In the circumstances of this case, Ofcom believes it may be helpful to reflect the dilution effect in an adjustment to BT’s wholesale market share imputed from the retail level as an aid to interpretation when that share is compared to conventional competition law benchmarks.

A2.2 Ofcom has considered two possible ways in which such an adjustment to BT’s market share might be made for the purposes of the analysis of the market in this case. The results of applying these two methods are discussed in Section 5. This Annex expands on paragraphs 3.27 to 3.41 to explain the basis for the two methods used by Ofcom in this investigation. First ‘method 1’, which is the simpler of the two methods and is not explicitly related to economic theory, is described. Then ‘method 2’ is explained, and the grounding in underlying theoretical economic relationships of the adjustment derived using this method, is set out.

Method 1

A2.3 Ofcom’s method 1 reduces the market share of operators providing only an indirect constraint on BT’s wholesale prices (i.e. cable operators)\(^1\) by multiplying it by a dilution factor of 0.6. BT’s share is recomputed as a proportion of this smaller total. The adjustment made to the cable operators’ shares reflects the assumption that these constraints are 40% (0.4) weaker than the underlying direct constraints on BT at the retail level.

A2.4 BT’s share would be adjusted by the dilution factor under this method as follows:

\[
\text{Adjusted} S^{BT} = \frac{S^{BT}}{S^{BT} + S^{DataStream} + S^{LLU} + (S^{Cable} \times D)}
\]

where Adjusted\(_{S}^{BT}\) is BT’s adjusted share, \(S^{BT}\) is BT’s unadjusted share, \(S^{DataStream}\) is the unadjusted share of suppliers using DataStream, \(S^{LLU}\) is the unadjusted share of suppliers using LLU, \(S^{Cable}\) is the combined share of cable operators’ shares and \(D\) is the dilution factor (equal to 0.6).

\(^1\) The volumes from the AOL/ntl deal and ntl’s sale of intermediate services using DataStream as an input are not included in the adjustments. Ofcom considers that even were it to include the values, they would be de minimis and would not have a material bearing on the results of the adjustments.
The adjustment to determine the adjusted cable share\textsuperscript{182} is:

\[
AdjustedS_{\text{Cable}} = 1 - AdjustedS^{BT} - AdjustedS^{DataStream} - AdjustedS^{LLU}
\]

A2.5 As indicated above, under method 1 the cable share is multiplied by the dilution factor (0.6), to reflect the fact that the constraints placed upon BT by cable are indirect. However, the second equation in paragraph A2.4 shows that the sum of adjusted market shares defined above must equal unity. It in effect defines the consistent measure of the adjusted cable share as:

\[
AdjustedS_{\text{Cable}} = \frac{S_{\text{Cable}} \times D}{S^{BT} + S^{DataStream} + S^{LLU} + (S_{\text{Cable}} \times D)}
\]

Method 2

The Lerner Index\textsuperscript{183}

A2.6 The Lerner index is the ratio of the profit margin (i.e. the price minus marginal cost) to the price. It is intended as a measure of the degree of market power a firm possesses. The greater the ability to price above (marginal) cost, the greater the market power and the larger the value of the Lerner index.

A2.7 With standard assumptions of differentiable cost and demand functions and profit maximisation, it can be shown (see for example, Tirole (1988) p.219 (at footnote 187)) that the Lerner index for each firm is proportional to its market share and inversely proportional to the elasticity of demand. The proportion is a function of the amount by which a firm expects other firms to vary their output in response to changes in its own output (known as ‘conjectural variation’). This general formulation can be written as:

\[
(1) \quad L = \frac{(p - mc)}{p} = (1 + \lambda) \times \frac{s}{e}
\]

Where \(L\) is the value of the index, \(p\) is price, \(mc\) is marginal cost, \(\lambda\) is the conjectural variation, \(s\) is the firm’s market share of volume and \(e\) is (minus) the demand elasticity. If the firm also produces substitute or complementary products, then the Lerner formula will include additional cross elasticity terms.

A2.8 The Lerner index formula is derived on the assumption of short-run profit maximisation so it may not hold exactly at every point in time. However, it illustrates the relevance of market share as an indicator of market power, by showing that there is a theoretical basis for a connection between them.

The Hicks-Marshall Rules of Derived Demand

A2.9 The next part of this analysis makes use of the Hicks-Marshall rules which show how input demand is related to retail demand. Hicks assumed two inputs, labour and capital. In the application of these rules to this case, ‘labour’ is the wholesale intermediate service, IPStream, and ‘capital’ is the set of other inputs, such as

\textsuperscript{182} Note that \(AdjustedS^{DataStream}\) and \(AdjustedS^{LLU}\) are determined by simply replacing the numerator \(S^{BT}\) on the right hand side of equation (1) with \(S^{DataStream}\) and \(S^{LLU}\), respectively.

marketing and other retail functions (‘other input’). In Hicks’ model, the wage is set, for example by a union, and downstream firms act as price takers. In this case, BT is assumed to set the price of the wholesale intermediate service (IPStream) in a similar way to the union setting the wage rate in Hicks’ model.

A2.10 The assumptions required to obtain the general Hicks-Marshall rules are:

i) The production function is Constant Elasticity of Substitution.

ii) The demand function is of the constant elasticity type.

iii) The supply function for the other input is also of the constant elasticity type.

A2.11 However, the key results will hold locally even if these assumptions do not hold exactly (see Kennan (1998), page 2 (at footnote 187)).

A2.12 Under certain assumptions, the general rules reduce to the simpler formulation that the wholesale elasticity of demand is equal to the share of the wholesale input in the retail price multiplied by the retail elasticity. This result can be written (Kennan, page 8) as:

\[ e'' = \delta e' \]

where ‘\( e'' \)’ is the elasticity of wholesale demand for IPStream, ‘\( \delta \)’ is the dilution factor and ‘\( e' \)’ is the retail elasticity of demand.

A2.13 The additional assumptions required for equation (2) are:

i) the elasticity of supply of the other input should be infinite; and

ii) the elasticity of input substitution should be zero.

Relevance of assumptions in this case

A2.14 In order to derive a means of adjusting wholesale market shares, we shall make use of equation (2). It is therefore necessary to consider whether the conditions required for equation (2) to hold are realistic in this case. The key results hold even if the first set of assumptions (set out at paragraph A2.10) are not strictly satisfied, so we focus on the second set of assumptions (set out at paragraph A2.13).

A2.15 It may be reasonable to assume that the elasticity of substitution between IPStream and other inputs is (close to) zero, as required. This is because, in order to offer retail broadband services using BT’s network, it is necessary to use IPStream and the other input in essentially fixed proportions, at least in terms of one wholesale end user path being required for each retail subscriber. It is also worth noting that use of equation (2) is closely related to the absence of direct constraints at the wholesale level. If there were direct constraints, wholesale customers could switch away from IPStream in response to a price rise and it could not then be assumed that the elasticity of input substitution were zero.

A2.16 It seems reasonable to assume that, at least locally, the elasticity of supply of the other input is infinite in the sense that additional quantities can be obtained at the given market price. But if this is not the case, the elasticity of IPStream demand will be lower, and hence the potential price-cost margin higher, than given by equation (2). It therefore seems reasonable to assume that the elasticity of demand for
wholesale broadband intermediate services is approximately 0.6 times the elasticity of retail broadband demand, because if anything this may understate BT’s market power (i.e. price-cost margin).

**Derivation of method to adjust market shares**

A2.17 Equations (1) and (2) can now be used to calculate the market share which BT would need at the retail level if it were to exercise a level of market power there similar to its market power at the wholesale level given the absence of direct price constraints.

A2.18 Equation (1), the Lerner index in a form specific to the retail market, can be written as:

\[
L^r = (1 + \lambda^r) \frac{S^r}{e^r}
\]

where the superscript ‘r’ refers to the retail level. ADSL and cable are direct constraints on each other at the retail level. At the retail level ADSL is provided by a variety of retail ISPs, but here we consider these as a block, with a combined volume share of subscribers ‘s^b’.

A2.19 At the wholesale level, the following general relationship applies:

\[
L^w = (1 + \lambda^w) \frac{S^w}{e^w}
\]

where the superscript ‘w’ refers to wholesale.

A2.20 As discussed above, it is necessary for equation (2) to hold that the elasticity of input substitution should be zero and, given the relationship between IPStream and retail ADSL service, this is a reasonable assumption. Given this assumption, ‘s^w’ is the relevant wholesale market share of subscribers, ‘s^w’ and so the relationship can also be written as:

\[
L^w = (1 + \lambda^w) \frac{S^f}{e^w}
\]

A2.21 We now take account of the indirect nature of the constraints on BT at the wholesale level by using the relationship between wholesale and retail elasticity, equation (2), with ‘δ’ the dilution factor equal to 0.6, the proportion of the retail broadband price accounted for by intermediate services:

\[
e^w = 0.6e^r
\]

A2.22 Hence we can rewrite (4) as:

\[
L^w = (1 + \lambda^w) \frac{S^f}{0.6e^r} = 1.67(1 + \lambda^w) \frac{S^f}{e^r}
\]

A2.23 For our purposes the relative size of the conjectural variation factors at retail and wholesale levels is relevant (but it is not necessary to know the value of BT’s
conjectural variation in the wholesale broadband intermediate services market as we do not calculate the value of the Lerner index). Again given the assumption that
the elasticity of input substitution is zero, it can further be assumed that the
conjectural variation factors at retail and wholesale levels are the same:

\[(6) \quad \lambda^w = \lambda^r\]

A2.24 However, to the extent that this is not so, it might be argued that it would be
reasonable to assume a higher value at the wholesale level because of the smaller
number of wholesale suppliers. This would suggest a higher value for the Lerner
index for a given market share and hence that the adjustment factor derived below
would understate market power.

A2.25 Then comparing (3) and (5), given (6) implies:

\[(7) \quad L^w = 1.67L^r\]

A2.26 That is, a given level of market share implies a value of the Lerner index, or a
degree of market power, that is 1.67 times larger for the indirect wholesale
constraint compared to the direct retail constraint. Or to indicate the same degree of
market power, the wholesale share needs to be adjusted upwards by a
multiplicative factor of 1.67.

A2.27 This result arises because wholesale demand is a derived demand so, under the
assumptions set out above, the elasticity is lower than at the retail level by an
amount proportional to the dilution factor (the share of the cost of the wholesale
input in the retail price). This implies a higher equilibrium mark-up at the wholesale
level which can equivalently be represented as the product of a given (retail)
elasticity and higher market share also adjusted in proportion to the dilution factor.

More General Formulation

A2.28 In the preceding sections of this Annex, a method for adjusting market shares is
derived using the Hicks-Marshall analysis for intermediate inputs. In the following
section, it is shown that the same formulation can be derived in a more structural
way. This suggests that the former approach may even yield somewhat
conservative results.

A2.29 The approach taken here is to derive explicit formulations for the Lerner index both
in the retail market and in the wholesale market. A hypothetical industry made up of
m upstream firms and n downstream firms is assumed. For simplicity, the upstream
firms and the downstream firms are assumed to be structurally separated.
Upstream firms are assumed to supply an essential input to downstream firms
which downstream firms buy and sell to retail customers. Both downstream and
upstream firms compete in quantities à la Cournot (i.e., the conjectural variation
parameter is equal to zero; it is easy to relax this assumption). One unit of input is
needed to produce one unit of output (inputs are thus in fixed proportions).

A2.30 Upstream firms have a constant marginal cost \(mc^w_i\), where ‘i’ = 1, 2, ..., m. Each
upstream firm supplies a quantity \(q^w_i\) in the intermediate market. The wholesale
price is denoted as \(p^w = p^w Q^w\), where \(Q^w = q^w_1 + q^w_2 + ... + q^w_m\) is the total
quantity supplied in the wholesale market. Downstream firms pay this wholesale
price and, in addition, have a constant marginal cost \( mc'_i \), where ‘i’ = 1, 2, …, n.

Each downstream firm supplies a quantity ‘qi’ in the retail market. The retail price is denoted as \( p = p Q' \), where \( Q = q_1 + q_2 + ... + q_n \) is the total quantity supplied in the retail market. The demand function is downward sloping \( p' = \partial p / \partial Q < 0 \).

A2.31 Upstream and downstream firms play a two-stage game. First upstream firms supply intermediate quantities to the downstream market and the intermediate market clears. Then downstream firms compete in quantities in the downstream market. The equilibrium is solved backwards.

A2.32 In the second stage, downstream firms take the wholesale price as given and supply final quantities. The expression for the profit of a generic firm ‘i’ is:

\[
\pi_i = p - p^w - mc'_i \tilde{q}_i
\]  

A2.33 Taking the first-order condition with respect to \( q_i \) gives:

\[
p - p^w - mc'_i + p'q_i = 0
\]  

A2.34 Equation (11) can be manipulated into the standard Lerner index for the retail market (similar to equation (3) above): If all the ‘n’ downstream firm are identical, this then simplifies into:

\[
L' = \frac{1}{ne'}
\]  

A2.35 Equation (11) above can be written for every downstream ‘i’ = 1, 2, …, n. Taking the sum of all these first-order conditions, one gets:

\[
\sum_{i=1}^{n} (p - p^w - mc'_i + p'q_i) = n \left( p - p^w - \overline{mc'} \right) + p'Q = 0
\]  

where \( \overline{mc'} \) is the average downstream marginal cost. Since the intermediate market has to clear, the total downstream quantity must be equal to the total upstream quantity: \( Q = \sum_{i=1}^{n} q_i = \sum_{i=1}^{m} q^w_i = Q^w \). Equation (13) can then be inverted to get the inverse wholesale demand:

\[
p^w = p - \overline{mc'} + p'Q^w / n
\]  

A2.36 It is now possible to analyse the first stage of the game. The expression for the profit of a generic firm ‘i’ in the upstream market is:

\[
\pi^w_i = p^w - mc^w_i \tilde{q}_i^w
\]
A2.37 Taking the first-order condition of equation (15) with respect to \( q_i^w \) gives:

\[
(16) \quad p^w - mc_i^w + \phi' + \frac{p'}{n} + p^w Q^w n \frac{\hat{q}_i^w}{p^w} = 0
\]

A2.38 Equation (16) is used to obtain the Lerner index in the intermediate market:

\[
(17) \quad L^w = \frac{p^w - mc_i^w}{p^w} = -\left[ \phi' + 1 \frac{n + p^w Q^w}{n} \frac{\hat{q}_i^w}{p^w} \right] = -q_i^w \left[ n + \frac{p^w Q^w}{n} \frac{\hat{q}_i^w}{p^w} \right] = \frac{s_i^w n + 1}{\delta_i^w} - \frac{p^w Q^w}{np^w} q_i^w
\]

where \( \delta = \frac{p^w}{p} \) is the dilution factor.

A2.39 The Lerner index at the wholesale level is thus made up of two terms. Term A is very close to the expression derived using the Hicks Marshall rules (see equation (7)), but with a zero conjectural variation, consistent with the Cournot framework adopted here. In fact, as \( (n + 1)/n > 1 \) the exact expression derived above gives a higher mark-up than the one implied by the Hicks-Marshall rules, which is therefore conservative in this respect. The exact derivation also includes a second term, whose sign depends on the concavity of demand. If it is assumed that demand is linear, then term B above is zero. Equation (17) then simplifies to:

\[
(18) \quad L^w = \frac{s_i^w n + 1}{\delta_i^w} n
\]

A2.40 If the upstream market is made up of \( m \) identical firms, equation (18) is simply:

\[
(19) \quad L^w = \frac{n + 1}{m} \frac{1}{n \delta_i^w}
\]

A2.41 It therefore follows that adjusting wholesale market shares by the inverse of the dilution factor is consistent with a reasonable model of strategic interaction applied to an upstream/downstream industry.
Rational for using an NPV analysis

A3.1 Ofcom has conducted a thorough assessment of BT’s losses using an historical accounting analysis. This analysis includes a range of economic adjustments, such as the amortisation of customer acquisition costs over the customer life. Ofcom has considered whether, in the circumstances of this case, there are arguments for further economic adjustments (i.e. additional to those that are applied in the adjusted accounting analysis) that are not, or cannot easily be, implemented in the accounting analysis.

A3.2 In Ofcom’s view the key argument for further economic adjustments in this case depends on whether it was reasonable or appropriate that the profitability of BT’s behaviour in the period of the investigation relied on the achievement of future cost reductions (not matched by retail price reductions even in a competitive market), given the applicable circumstances in the retail residential broadband market. Below, Ofcom first sets out its assessment of this argument for further economic adjustments in principle; it then sets out the evidence that it is relevant in practice in the circumstances of this case and the reasons why it believes that the resulting arguments can only or most effectively be addressed in a forward-looking NPV analysis.

Future cost reductions: argument in principle

A3.3 When a product or service is at an early stage of development in a fast-changing market, it may be reasonable to expect that unit costs may fall over time. This can, for example, be because fixed costs are spread over a growing number of customers (economies of scale), through savings from learning how to provide the service more efficiently (learning by doing) or through falling input costs due to technological improvements.

A3.4 For expected future cost reductions to provide an argument for further economic adjustments, a necessary condition is that it is reasonable or appropriate that in a competitive market the profitability of current prices should depend on such future cost reductions. If not, then the assessment of today’s profit or loss using today’s costs would provide a true view of economic profitability and no further economic adjustment would be required. For example, one clear set of circumstances when this would be expected to apply is in a mature market in steady state. In such circumstances there would be a significant risk that the reliance for profitability by a firm dominant in that market or a related market on future cost reductions (which are assumed not to be matched by price reductions) would be inconsistent with a competitive outcome.

A3.5 But in some circumstances it may be considered reasonable to set an initial price for a product that does not cover the costs of serving early customers, but which is sustainable once expected future cost reductions are achieved (and not matched by price reductions). For example, at the time of a product launch in a new or immature market such pricing behaviour may not be unreasonable, if justified by the fast-developing or uncertain nature of future demand or cost conditions. It may be that a relatively high price, reflecting initial relatively high costs, would choke off market demand. Or it may be that future cost reductions are causally related to current behaviour, such as through economies of scale and learning by doing, which (especially in a subscription business) can provide dynamic linkages through time
between customer acquisition in an earlier period and lower costs in later periods. In these circumstances, it could be reasonable for losses on customers acquired during an initial period to be offset by reasonably expected and causally related future profit on those customers in later periods and on subsequently acquired customers, within reasonable timescales and under competitive conditions.

A3.6 The idea that it may be rational to price a new product at a low, even loss-making level initially in order to stimulate demand is found in the management or marketing literature, where it is sometimes described as ‘penetration pricing’ or seen as part of a supposed ‘product life cycle’. Future cost reductions resulting from economies of scale, learning by doing and gaining customer acceptance (leading to lower marketing costs) are sometimes cited as part of the justification for such strategies. Weaknesses in such an argument, however, are that such approaches are not necessarily derived from an underlying economic theory and may not distinguish between legitimate competitive strategies and anti-competitive behaviour.

A3.7 Whilst the former issue is not necessarily of great relevance in the present context, the latter certainly is. Clearly Ofcom should not permit exclusion of rivals by BT but it would also be undesirable to prevent BT pursuing a legitimate competitive strategy. Ofcom believes that in order to distinguish between the two, it is necessary to test whether any initial losses incurred as part of a new product marketing strategy could be recovered under competitive conditions. Ofcom believes that the most appropriate means of doing so is by means of an NPV analysis based on forecasts of costs and revenues which reflect reasonable expectations of future cost reductions and reasonable assumptions regarding the extent to which these would be reflected in price reductions in a competitive market. The relevance of potential sources of cost reductions to the present case is discussed in the rest of this Annex.

**Future cost reductions: evidence of relevance and why effectively addressed in NPV analysis**

A3.8 In the light of the discussion above of the argument in principle, Ofcom has considered the following possible sources of a causal link between BT’s behaviour in the period of the investigation and future expected cost reductions:

- helpdesk costs;
- falling customer acquisition costs;
- economies of scale in service costs;
- learning by doing;
- avoiding relatively high prices that might have choked off demand; and
- market education.

**Helpdesk costs**

A3.9 It is likely that newly acquired customers use the technical helpdesk more intensively than existing, more mature subscribers that are familiar with the product. Therefore, it is likely that helpdesk costs for the customers acquired during the period of the investigation will be lower in future periods than in the initial period.
Customer acquisition costs

A3.10 The evidence suggests a tendency for customer acquisition costs to decline during the period of the investigation as shown in Figure A3.1 below.

Figure A3.1: BT’s Broadband Portfolio – Customer Acquisition Costs (actual and six monthly moving average)

[Graph]

Source: Ofcom analysis

A3.11 In addition, both BT and other ISPs forecast future reductions in acquisition costs. However, for this by itself to provide a sound basis for a further economic adjustment, a causal relationship should be established between BT’s behaviour during the period of the investigation and these falling acquisition costs. The nature of this causal relationship has not been clearly established, although it is possible that demonstration effects and network effects which make it easier to attract subscribers once a significant number of consumers have adopted broadband, apply in this market.

Economies of scale

A3.12 The evidence suggests that economies of scale were present in the earlier part of the period of the investigation. However, Ofcom’s analysis suggests that their continued relevance by the end of the period of the investigation is less clear. Figure A3.2 below shows how BT’s unit service costs have changed over the period.

Figure A3.2: BT’s Broadband Portfolio – unit service costs

[Graph]

A3.13 Figure A3.2 suggests that overall unit costs have fallen between April 2002 and March 2005, but that costs in the last 10 months of the period have flattened off. Care is needed in interpreting this information to inform trends as Ofcom’s adjustment to include additional relevant costs from the regulatory accounts is a figure per subscriber by financial year and as a result this may suppress the trend between months in the same financial year.

A3.14 Figure A3.3 below shows the relationship between unit costs and volume of subscribers. Although, unit costs levelled off in July 2004 at about 800,000 customers, which might suggest that BT had largely exhausted the available economies of scale by the end of the period of the investigation in December 2004, the fitted curve suggests the existence of further economies of scale at higher subscriber numbers. However, as noted above, care is needed in interpreting this data, particularly given that certain costs are only allocated on an annual basis.

Figure A3.3: BT’s Broadband Portfolio – evidence of economies of scale in service costs

[Graph]

Source: Ofcom calculation

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184 Service costs comprise all ongoing costs used to calculate the service margin. Customer acquisition costs, fixed asset and development costs are excluded.
Learning by doing

A3.15 Some types of costs are likely to give rise to future cost reductions as a result of learning by doing. For example, improved call centre processes and efficiencies could lead to lower call times and lower staff costs. Different assumptions about the extent to which learning by doing effects could result in a cost advantage over later entrants, which would not necessarily be fully competed away in lower prices, can be reflected in Ofcom’s ‘contestability’ analysis. Using such an approach, the greater the importance accorded to learning by doing, the longer would be the period before contestability is assumed and margins cease to grow.

Demand

A3.16 The possible arguments for further economic adjustments on the demand side raise difficult questions. On the one hand, it may be that prices during the period of the investigation were set below costs in that period in order to avoid relatively high prices that might have choked off demand. But a key part of these costs was customer acquisition costs, which constituted an important dimension of competition between ISPs, in addition to the prices charged and the range and quality of products offered. It is also possible that acquisition expenditure incurred by BT during the period of the investigation, e.g. marketing and advertising cost, was causally related to increased future demand. But it is not straightforward to disentangle legitimate demand stimulation under competitive conditions from anti-competitive below-cost pricing and acquisition expenditure.

A3.17 Similar difficulties arise in considering whether historic costs are causally related to future demand by educating consumers about the benefits of broadband. BT has claimed that:

“…in the early years the industry was found to be less mature than was at first thought. This meant that much of the marketing effort designed to achieve the customer volume forecasts was in fact fulfilling the role of market education, raising customer awareness of what Broadband was and how it might be useful to them, rather than translating into direct sales volumes for the BT product”.185

Conclusion

A3.18 The evidence considered in this Annex demonstrates that customer acquisition costs fall over time, service unit costs reduce over time, and economies of scale in service costs do exist. These factors indicate there could be elements within the analysis beyond those that can be adjusted for in the historic management accounts that have an impact on future costs.

A3.19 By contrast, the significance of these future factors can be effectively assessed in the context of a forward looking NPV analysis where assumptions regarding future costs and demands are explicitly stated and the length of the period of analysis is extended.

A3.20 Therefore Ofcom believes within the context of this financial analysis greater weight needs to be placed on the forward looking NPV analysis when compared to the historic management accounts. The management accounts even with the adjustments made do not address the issue of improved business efficiency

185 BT’s response to Ofcom’s notice under section 26 of the Act, 16 March 2004, question 21.
(through learning and other means) after the period of analysis which is limited to two years.
Annex 4

Adjusted accounts analysis

Introduction

A4.1 This Annex sets out Ofcom's methodology for preparing the Adjusted Accounts. In particular it discusses: the sources of data available to Ofcom in its analysis; and the adjustments Ofcom made to BT’s management accounts data in producing the ‘Adjusted Accounts’.

Sources of data

A4.2 Two primary sources of historical financial data were available to Ofcom for its analysis: BT’s monthly management accounts and BT’s regulatory financial statements.

A4.3 The management accounts and regulatory financial statements have different characteristics and are prepared for different purposes. BT’s regulatory accounts are prepared to enable BT to meet its regulatory obligations. As BT’s retail consumer broadband services are not subject to any specific ex ante regulation which requires BT to prepare regulatory financial statements for these products, BT does not routinely prepare regulatory accounting statements for retail consumer services. The regulatory accounting analysis used in this investigation was prepared from the regulatory accounting system specifically at Ofcom's request.

A4.4 Monthly management accounts for residential consumer services are prepared to assist management in running the business on a day-to-day basis, where timeliness is more important than technical accuracy.

A4.5 Ofcom considers that in the context of this investigation, management accounts are more appropriate as a primary data source than regulatory financial statements. The principal reasons for this are that:

a) Management accounts provide data on a monthly basis; regulatory accounts on a quarterly basis. The availability of monthly accounts enables monthly cost trends to be assessed; and

b) Management accounts are routinely used by operational management for commercial decision making. Underlying analyses are prepared and management is familiar with the data and provide explanations for variances in these data over time and against budgets. This is not the case for regulatory accounts.

A4.6 However, unlike regulatory accounts which are prepared on a fully allocated cost basis (i.e. all of BT’s costs are allocated down to individual services), management accounts may exclude certain costs which, although relevant, are not controllable at a business unit level. In order to ensure that no relevant costs were excluded from its analysis, Ofcom requested annual and six monthly reconciliations between management and regulatory accounts. Ofcom has reviewed each reconciling item individually and where appropriate has included in its analysis those costs included in the regulatory accounts but not in the management accounts – the ‘additional relevant costs’.
The Adjusted Accounts

A4.7 This investigation is concerned with BT’s pricing behaviour from June 2002 to March 2005. In this section, Ofcom assesses the question of whether BT has made losses over the relevant period by assessing BT’s historical performance using its financial accounts for the period April 2002 to March 2005.

A4.8 Ofcom has made a number of adjustments to BT’s management accounts for both BT Openworld Broadband and BT Broadband to derive the Adjusted Accounts used in the historical accruals analysis as follows:

a) technical corrections and adjustments to the management accounts;

b) economic adjustments to convert accounting cost recovery paths to economic cost recovery paths; and

c) converting costs to the most relevant cost standard.

A4.9 The management accounts of BT Openworld and BT Broadband were produced on different bases. BT Openworld was a separate business division within the BT Group, with separate management accounts, whereas the BT Broadband products were accounted for as individual products within the BT retail business. As a result, the underlying methodology used to produce the two sets of management accounts was different and therefore, in some cases, Ofcom made different adjustments to the two sets of management accounts to produce the Adjusted Accounts.

A4.10 Technical corrections include smoothing of costs to better reflect the accruals basis of accounting (e.g. spreading the cash cost of modems over the periods over which they are used), the inclusion of relevant costs excluded from the management accounts (but, for example, included in the regulatory accounts ) and the reallocation of certain costs to more appropriate headings (for example BT Openworld’s accounts netted off the cost of the BT Retail telemarketing costs in revenues – Ofcom’s analysis treats these as a marketing cost which is included in subscriber acquisition costs and amortised).

A4.11 Ofcom has reviewed in detail BT’s reconciliation between its management accounts and regulatory accounts in order to identify any relevant costs captured in the more complete regulatory accounts but which were not included in BT’s management accounts – ‘additional relevant costs’.

A4.12 For BT Broadband these additional costs are significant, as shown in Table A4.1 below. The additional relevant costs identified by Ofcom for BT Openworld were not material.

Table A4.1: Summary of additional costs identified in regulatory accounts and added to management accounts results - BT Broadband

<table>
<thead>
<tr>
<th></th>
<th>BT Broadband (£m)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2002/3</td>
</tr>
<tr>
<td>Revenues</td>
<td>(X)</td>
</tr>
<tr>
<td>Wholesale network costs</td>
<td>(</td>
</tr>
<tr>
<td>Call Centre costs</td>
<td>(X)</td>
</tr>
<tr>
<td>Other costs</td>
<td>(</td>
</tr>
<tr>
<td>Total additional costs</td>
<td>(X)</td>
</tr>
<tr>
<td>Net Adjustment</td>
<td>(</td>
</tr>
</tbody>
</table>

Source: Ofcom’s analysis of BT reconciliations
A4.13 In its response to Ofcom's request for a reconciliation of the differences between management and regulatory accounts, BT commented:

a) “[it] is not a process which would be undertaken for normal internal decision making"

b) “the management accounts show internal transfers as agreed between the relevant business units whereas in AS [Regulatory accounts] these are reversed and replaced by the underlying costs"

A4.14 BT also comment that the management accounts “focus on controllable costs” implying that there are costs beyond the control of management and which need not be included in the management accounts.

A4.15 Whilst these costs are excluded from its management accounts, BT recognises their relevance to the overall profitability of the business in its business planning demonstrated by BT’s business plans including a provision for ‘AS accounting recharges’ calculated as [X]% of sales and general administration (“SGA”) costs.

A4.16 Table A4.2 summarises the results of the adjustments that Ofcom has made to BT's management accounts after the inclusion of the additional regulatory accounts costs:

Table A4.2: Summary of Ofcom's adjustments to BT's management accounts including additional regulatory revenues and costs

<table>
<thead>
<tr>
<th></th>
<th>BT Broadband Portfolio</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2002/3</td>
</tr>
<tr>
<td>Unadjusted EBIT (£m)</td>
<td>(£)</td>
</tr>
<tr>
<td>Adjustments to service margin</td>
<td>(&gt;_&lt;)</td>
</tr>
<tr>
<td>Adjustments to subscriber acquisition costs</td>
<td>(&gt;_&lt;)</td>
</tr>
<tr>
<td>LRAIC adjustments</td>
<td>(&gt;_&lt;)</td>
</tr>
<tr>
<td>Return on turnover</td>
<td>(£)</td>
</tr>
<tr>
<td>Adjusted EBIT after RoT (£m)</td>
<td>(£)</td>
</tr>
</tbody>
</table>

Source: Ofcom analysis

A4.17 The main adjustment to the service margin is the capitalisation and amortisation of development and expenditure costs which in the management accounts are written off in the period they are incurred.

A4.18 The most significant adjustment to subscriber acquisition costs is to reallocate them so that they are charged to the profit and loss account over the life time of the customer and not expensed when incurred. In a new and growing business such as consumer broadband the effect of the adjustment is to significantly reduce the amount of subscriber acquisition costs charged in the early years of the business.

A4.19 As set out earlier in Section 4, Ofcom considers that the pricing observed over two to three years suggests the relevant time horizon is the long run, and that the relevant approach to determining costs is a therefore a long run incremental cost approach. Taken over the relevant time horizon and applying this over the relevant
increment of output, LRAIC approximates AVC and should be viewed as the relevant cost floor.

A4.20 Costs and revenues in the management accounts are calculated on a FAC basis. These include common costs, which are not relevant to the LRAIC cost floor, and Ofcom has therefore considered the extent to which costs in the management accounts need to be adjusted to exclude common costs. In Ofcom’s view only one significant category of costs included in BT’s management accounts can be regarded as common - that of systems development costs, on the basis that many of the computing systems for customer billing and customer care used for consumer broadband are also used for business broadband services. In Ofcom’s view the inclusion of the fully allocated cost for all cost categories included in the management accounts other than systems development is likely to overstate the incremental cost, because there will be some portions of the fully allocated cost that a more detailed analysis could reasonably classify as common. However, such a detailed analysis would be very time consuming and unlikely to make a material difference to the analysis.

A4.21 Ofcom’s analysis has adjusted BT’s costs to put them on a LRIC basis. To do this, Ofcom has applied estimates of the ratios between LRIC and FAC costs (‘LRIC factors’) to the FAC numbers provided by BT. In doing this, Ofcom considered a range of different LRIC factors for the other additional relevant costs identified in the reconciliation between the management accounts and regulatory accounts ranging from [a]% to [b]%. The base case results assume that 100% of the additional relevant costs are incremental. Ofcom recognises that this is likely to overstate the true LRIC proportion of these costs, and therefore assuming that 100% of all additional relevant costs are incremental presents the results on a ‘worst case’ assumption. Lower LRIC proportions are considered in the NPV analysis – see paragraphs A4.132 for details. However, these lower LRIC proportions do not reverse the result that BT incurs losses under an historical accounting approach.

A4.22 When using historical accounting information to assess profitability, a commonly used measure of the rate of return actually earned is return on capital employed ("ROCE"). Using this measure, an activity is considered not to be profitable if the ROCE that it earns falls below the level that would be required by investors taking account of the risk incurred by investing in the activity, i.e. below the activity’s weighted average cost of capital ("WACC").

A4.23 The use of ROCE as a measure of profitability is not, however, appropriate in all circumstances, particularly in the case of activities that inherently require relatively little physical or working capital. This applies strongly to BT’s retail consumer broadband business. At the retail level capital employed is typically small relative to turnover. A frequently-used alternative in such circumstances is Return on Turnover ("RoT") or Return on Sales ("RoS"). ROCE is generally considered to have greater economic significance than RoS, which has the disadvantage that there is no theoretical benchmark with which to compare it. This means that the ‘required' return on sales will vary directly with the capital intensity of the firm and its cost of capital. Nevertheless an assessment of profitability on RoS can be made meaningful if it is compared to the return on sales with that earned by other firms of similar capital intensity and risk.

A4.24 Competition authorities have provided indications of an appropriate return on sales where capital intensity is low. In the 1999 report by the then Monopolies and Mergers Commission ("MMC") on BT, instead of using return on capital employed,
the MMC based its assessment of the profitability of BT’s calls business on RoT.\(^{186}\) The MMC considered that the reason this approach could be applied to BT’s call business was the “very high proportion of turnover accounted for by bought-in services”. The MMC took the view that a RoT of 1.5% would be appropriate for BT’s calls-to-mobiles activity. In contrast, in its report on Scottish Hydro-Electric plc a return of 0.5% was adopted. The MMC considered, at paragraph 2.117, that:

“the potential for competition from new operators and the speed with which it could impact on BT are factors which we believe differentiate BT’s calls to mobile activity from the circumstances of Scottish Hydro-Electric.”

A4.25 For these reasons, in the historical accounting analysis set out in this section, Ofcom uses RoS as a reasonable measure of the minimum required return on investment, and has used as a benchmark a rate consistent with the MMC’s analysis.

A4.26 The results of the above adjustments are referred to as the ‘Adjusted Accounts’.

A4.27 For the purposes of this investigation, BT Openworld is assumed to have re-launched services in April 2002, when it introduced its BT Openworld Home 500 Plug & Go product, and this is treated as the starting point for the profitability analysis. At this point it had 65,696 subscribers and Ofcom has included the costs associated with acquiring those customers in its analysis (together with the value of existing fixed assets and development expenditure re-valued at MEA values).

**BT Openworld**

**Management accounts**

A4.28 Ofcom relied on BT Openworld monthly management accounts. The reporting format used from April 2002 to May 2004 changed in June 2004. Ofcom has therefore reallocated BT’s revenue and cost categories to Ofcom’s relevant cost categories as summarised in Table A4.3.

**Table A4.3: Table of BT and Ofcom costs and revenue categorisation for BT Openworld**

<table>
<thead>
<tr>
<th>BT’s management accounts April 2002 to May 2004</th>
<th>BT’s management accounts June 2004 to March 2005</th>
<th>Ofcom format</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Revenues</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ADSL Rental</td>
<td>Rental</td>
<td>Connection &amp; Rental</td>
</tr>
<tr>
<td>ADSL total</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Advertising</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Buy / Sell Trading</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dial Revenue</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other Revenue</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Subscription Consumers 24/7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Value Add (Non Access)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Z1</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Cost of sales</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ADSL &amp; IP Central Charges</td>
<td>Network - ADSL Rental</td>
<td>IP Central Rental &amp; ADSL connection charge</td>
</tr>
<tr>
<td></td>
<td>Network - Central Plus</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Network - ADSL Connection</td>
<td></td>
</tr>
</tbody>
</table>

Note: Only material BT’s cost/revenue categories are shown.

A4.29 Ofcom also received clarifications from BT relating to specific revenue and cost categories and has made a number of adjustments as set out below.

Revenues

A4.30 Not all of BT’s management accounts differentiate between connection revenues received as a result of charging new customers a connection fee, and ongoing revenues from existing subscribers. BT provided a breakdown of total monthly revenues between connection and ongoing rental revenues\(^{187}\) from April 2002 to March 2004. Ofcom has adopted this analysis in its Adjusted Accounts.

A4.31 This analysis also shows total monthly revenues in excess of those stated in the management accounts. This is explained by the fact that revenues per the management accounts are stated net of telesales costs. Ofcom has identified these costs separately under BT retail telesales costs (cost of sales).

A4.32 Ofcom assumes that all revenues in April 2004 and May 2004 are related to rental revenues as BT had stopped charging its customers any connection fee. Ofcom also understands that \([\rightarrow]\), as is the case for the remainder of the financial year 2004/5.

\(^{187}\) Response to Question 38 of 8th notice under section 26 of the Act, dated 16 March 2004.
Call centre costs

A4.33 Ofcom understands that call centre costs relate to five types of activity:

<table>
<thead>
<tr>
<th>Cost type</th>
<th>Provider</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales</td>
<td>Acquisition</td>
</tr>
<tr>
<td>Order management desk</td>
<td>Acquisition</td>
</tr>
<tr>
<td>Technical helpdesk</td>
<td>Recurring</td>
</tr>
<tr>
<td>Service</td>
<td>Recurring</td>
</tr>
<tr>
<td>Repair</td>
<td>Recurring</td>
</tr>
</tbody>
</table>

A4.34 Call centre costs for BT Openworld are recorded in the management accounts under the ‘Helpdesk’, ‘Customer Service’ and ‘Order Management Desk’ cost categories:

a) Helpdesk: invoiced by [X], covering technical, service and repair services.

b) Customer Services: originating from [X], covering helpdesk and billing costs.

c) Order Management Desk: invoiced by [X], relates to off-line product orders.

A4.35 In an attempt to identify set-up costs separately from ongoing costs, Ofcom has requested information regarding the level of call centre calls relating to new customers as opposed to existing customers. BT stated that it “does not make this distinction in monitoring and tracking costs, as acquisition costs are prudently expensed at the time of customer acquisition”. Although specific data is not available, BT comments that calls handled by the Sales and Order Management Desk are “deemed to be calls from new customers relating to connection”, whereas those handled by the Help, Service and Repair desks are “typically, but not always, expected to relate to in-life customer management”.

A4.36 In Ofcom’s view it is reasonable to expect that a proportion of Customer Service and Helpdesk costs relate to joiners’ calls relating to difficulties in connection and should therefore reasonably be considered to be subscriber acquisition costs. In the absence of specific data, Ofcom has estimated the costs of joiner calls for Customer Service and Helpdesk costs based on an assumption that the call centre costs attributable to a new joiner on joining are the same as those incurred on average by an existing subscriber in a year. The estimated costs of calls from joiners are then reallocated to the Order Management Desk cost category and amortised as subscriber acquisition costs.

ADSL connection charge

A4.37 BT indicated that a connection charge was included within the ‘ADSL and IP Central Charges’ cost category and identified monthly ADSL connection charges separately.

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188 BT response to Question 5 (iii) of 17th notice under section 26 of the Act, dated 18 February 2005.
189 BT response to Question 5 (iii) of 17th notice under section 26 of the Act, dated 18 February 2005.
190 BT response to Question 5 (i) of 17th notice under section 26 of the Act, dated 18 February 2005.
192 BT response to Question 5(ii) of 17th notice under section 26 of the Act, dated 18 February 2005.
193 BT response to Question 5(ii) of 17th notice under section 26 of the Act, dated 18 February 2005.
for the two years to March 2004. Ofcom has added a separate ‘ADSL Connection Charge’ cost category for this item in its Adjusted Accounts.

A4.38 Based on this breakdown to March 2004, Ofcom has calculated an average connection charge of £[>]* per joiner and estimated the ADSL Connection Charge for April and May 2004.

A4.39 This estimate applies to those two months only as BT Management Accounts have identified this item separately as of June 2004.

Past costs

A4.40 In Ofcom’s view it is relevant to include in the analysis of profitability during the period of the investigation the costs in relation to the value of assets in use at the beginning of the period analysed (i.e. as at 1 April 2002).

A4.41 Accordingly, customer acquisition costs of £[>]* million, product development costs of £[>]* million and capital expenditure of £[>]* million (BT Openworld Analysis, Worksheet 18.bf cost) have been included as brought forward costs.

Pay costs

A4.42 Ofcom’s review of BT’s management accounts identified significant variations in ‘Pay costs’ in January 2003 and May 2004 and assumed these to be related to one-off adjustments, on the basis that staff numbers are not volatile. As these variations potentially distort results in a given month, Ofcom has reallocated these costs over three months to smooth costs.

Regulatory accounts and additional relevant costs

A4.43 Ofcom requested annual and six monthly reconciliations between management and regulatory accounts as well as narrative explanations of the reconciling items. Ofcom reviewed each reconciling item and sought to include in the Adjusted Account only such regulatory costs as are relevant to BT Openworld consumer residential broadband services (the ‘additional relevant costs’).

A4.44 Ofcom also requested BT to allocate additional costs between consumer and business services. Where the breakdown was not available, Ofcom has estimated revenues/costs attributable to each business segment based on total revenues/costs as per the management accounts.

A4.45 Regulatory accounts are available for twelve or six month periods, however, Ofcom’s Adjusted Accounts analysis is based on monthly management accounts. Therefore, additional relevant costs have been allocated to appropriate cost categories on a monthly basis in proportion to the volume of average subscribers in the month.

A4.46 Table A4.4 below shows the additional relevant costs identified in the reconciliation between management accounts and regulatory accounts for BT Openworld.

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*194 Response to Question 7 of Ofcom’s informal questions of 6 May 2004.*
Table A4.4: Additional relevant costs – BT Openworld

<table>
<thead>
<tr>
<th>Summary of regulatory AS adjustments for BT Openworld</th>
<th>02/03</th>
<th>03/04</th>
<th>04/05</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>£ '000s</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Additional revenue</td>
<td>0</td>
<td>[X]</td>
<td>0</td>
</tr>
<tr>
<td>Additional costs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Wholesale costs</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>- Call centre costs</td>
<td>0</td>
<td>[X]</td>
<td>0</td>
</tr>
<tr>
<td>- Other costs</td>
<td>[X]</td>
<td>[X]</td>
<td>0</td>
</tr>
<tr>
<td>Total additional costs</td>
<td>[X]</td>
<td>[X]</td>
<td>0</td>
</tr>
<tr>
<td>Net adjustment</td>
<td>[X]</td>
<td>[X]</td>
<td>0</td>
</tr>
</tbody>
</table>

Source: BT Openworld Management accounts Data.xls worksheet 36. AS BTOW Adj

Additional relevant costs 2002/3

A4.47 BT provided a reconciliation between its management accounts and regulatory accounts for BT Openworld for the financial year ended 31 March 2003.\(^{195}\)

A4.48 Adjustments related to ‘buy/sell’ relate to the treatment of sales made by call centres which are then recharged to the relevant business unit. Add/buy costs have been allocated to BT Retail Telesales costs.

Additional relevant costs 2003/4

A4.49 BT provided a reconciliation between its management accounts and regulatory accounts for BT Openworld for the financial year ended 31 March 2004.\(^{196}\)

A4.50 The reconciliation identified the following reconciling items:

a) Other BT Yahoo! Revenue adjustments comprise “[X]”.\(^{197}\) These revenues have been allocated to ‘Other’ revenues.

b) “[X]”.\(^{198}\) These costs have been allocated to ‘Pay, team costs, contractors’ costs’.

c) “[X]”.\(^{199}\) These costs have been allocated to ‘Customer Service’ costs.

d) “Small differences between AS & Management accounts include ‘Intra Openworld Charges in the Management Accounts’.”\(^{200}\) These costs have been allocated to ‘Other’ costs.

e) “[X]”.\(^{201}\) These costs have been allocated to ‘Other’ costs.

Additional relevant costs 2004/5

A4.51 BT’s reconciliation of management accounts to regulatory accounts for 2004/5 did not distinguish between adjustments relating to BT Openworld or BT Broadband.

\(^{195}\) Response to Question 41 of Ofcom’s 8th notice under section 26 of the Act dated 16 March 2004.

\(^{196}\) Response to Question 2 of Ofcom’s 17th notice under section 26 of the Act dated 18 February 2005.

\(^{197}\) Response to Question 2 of Ofcom’s 17th notice under section 26 of the Act dated 18 February 2005.

\(^{198}\) Response to Question 2 of Ofcom’s 17th notice under section 26 of the Act dated 18 February 2005.

\(^{199}\) Response to Question 2 of Ofcom’s 17th notice under section 26 of the Act dated 18 February 2005.

\(^{200}\) Response to Question 2 of Ofcom’s 17th notice under section 26 of the Act dated 18 February 2005.

\(^{201}\) Response to Question 2 of Ofcom’s 17th notice under section 26 of the Act dated 18 February 2005.
A4.52 Reconciliations for previous years indicated that nearly all adjustments related to BT Broadband. Ofcom has therefore applied all of the additional relevant regulatory costs identified in the 2004/5 reconciliation to BT Broadband. There are therefore no additional relevant regulatory costs for BT Openworld in 2004/5.

Summary

A4.53 Table A4.5 below shows the total ‘technical adjustments made to BT’s management accounts for BT Openworld.

Table A4.5: Technical adjustments to BT Openworld Management accounts

<table>
<thead>
<tr>
<th>£m</th>
<th>As per BT’s Management Accounts</th>
<th>After Adjustments</th>
<th>As per BT’s Management Accounts</th>
<th>After Adjustments</th>
<th>As per BT’s Management Accounts</th>
<th>After Adjustments</th>
<th>As per BT’s Management Accounts</th>
<th>After Adjustments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revenues</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
</tr>
<tr>
<td>Cost of Sales</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
</tr>
<tr>
<td>Gross Margin</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
</tr>
<tr>
<td>SGA</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
</tr>
<tr>
<td>EBIT</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
</tr>
</tbody>
</table>

Source: BT Openworld Management accounts Data.xls worksheet 1. BTOW Adjusted

BT Broadband

Management accounts

A4.54 BT provided monthly management accounts for BT Broadband for the period April 2002 to March 2005.\(^\text{202}\) The reporting formats for the accounts were changed between April 2002 to March 2004, April to May 2004 and June 2004 onwards. Ofcom has therefore reclassified BT’s revenue and cost categories to Ofcom’s relevant cost categories as summarised in Table A4.6 below.

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\(^{202}\) BT Broadband Management Accounts of April 2002 to March 2004 were provided in response to Question 12 of Ofcom’s 8th notice under section 26 of the Act, dated 16 March 2004; Management Accounts for April and May 2004 were provided in response to Question 1 of Ofcom’s 11th notice under section 26 of the Act dated 30 June 2004; Management Accounts for June to September 2004 were provided in response to Question 1 of Ofcom’s 14th notice under section 26 of the Act, dated 9 November 2004; and Management Accounts for October 2004 to March 2005 were provided in response to Question 1 of Ofcom’s 16th notice under section 26 of the Act, dated 25 January 2005.
Table A4.6: Table of BT and Ofcom costs and revenue categorisation for BT Broadband

<table>
<thead>
<tr>
<th></th>
<th>BT’s management accounts April 2002 to March 2004</th>
<th>BT’s management accounts April &amp; May 2004</th>
<th>BT’s management accounts June 2004 to March 2005</th>
<th>Ofcom format</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Revenues</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Connection</td>
<td>Connection</td>
<td>Connection / ADSL connection</td>
<td>ADSL connection</td>
<td>Connection</td>
</tr>
<tr>
<td>Hardware</td>
<td>Hardware / CPE</td>
<td>CPE</td>
<td>Hardware</td>
<td></td>
</tr>
<tr>
<td>Rental</td>
<td>Rental</td>
<td>Rental</td>
<td>Rental</td>
<td></td>
</tr>
<tr>
<td>Employee discount</td>
<td>Other discounts / rebates / returns</td>
<td>Other</td>
<td>Other discounts / rebates / returns</td>
<td></td>
</tr>
<tr>
<td><strong>Cost of sales</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Connection</td>
<td>Connection / ADSL connection</td>
<td>ADSL connection</td>
<td>Connection</td>
<td></td>
</tr>
<tr>
<td>Rental</td>
<td>Rental / ADSL rental</td>
<td>ADSL rental</td>
<td>Rental</td>
<td></td>
</tr>
<tr>
<td>Adjustments</td>
<td>Adjustments</td>
<td>Adjustments</td>
<td>Adjustments</td>
<td></td>
</tr>
<tr>
<td>Central Plus</td>
<td>Central Plus</td>
<td>Central Plus</td>
<td>Central Plus Connection &amp; Central Plus Rental</td>
<td></td>
</tr>
<tr>
<td>Rental</td>
<td>Rental / ADSL rental</td>
<td>Rental</td>
<td>Rental</td>
<td></td>
</tr>
<tr>
<td>Other discounts /</td>
<td>Other discounts / rebates / returns</td>
<td>Other</td>
<td>Other discounts / rebates / returns</td>
<td></td>
</tr>
<tr>
<td>rebates / returns</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td><strong>SGA</strong></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Total pay</td>
<td>Pay</td>
<td>Pay</td>
<td>Total Pay</td>
<td></td>
</tr>
<tr>
<td>Other Externals</td>
<td>Commission payments Other External - SGA</td>
<td>Platforms</td>
<td>Customer Contact Centre (intra)</td>
<td></td>
</tr>
<tr>
<td>Customer Contact</td>
<td>CCC – SGA</td>
<td>Service costs of Helpdesk, CCC - service</td>
<td>Customer Contact Centre (intra)</td>
<td></td>
</tr>
<tr>
<td>Centre (intra)</td>
<td></td>
<td>, and CCC - repair</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Additional CCC</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Repair &amp; Service)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other BT Supplier</td>
<td></td>
<td></td>
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<tr>
<td>Costs</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unallocated task</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>(Service Desk,</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Repair Desk and THD</td>
<td></td>
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<tr>
<td>&amp; [ ] costs)</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other Intra</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Business Services</td>
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<tr>
<td>Other</td>
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<td></td>
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<tr>
<td>OMD</td>
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<tr>
<td>CCC Sales</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Acquisition cost</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>of Helpdesk, CCC</td>
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<tr>
<td>service and CCC</td>
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<tr>
<td>repair</td>
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<tr>
<td><strong>Marketing</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Marketing</td>
<td>Marcomms</td>
<td>Marketing</td>
<td>Marketing – acquisition and non acquisition costs</td>
<td></td>
</tr>
<tr>
<td>Additional marcomms</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Development</strong></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Development &amp;</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Deployment</td>
<td></td>
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<td></td>
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<tr>
<td>Web Page Development</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BT.com (Intra)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cust Call Centre</td>
<td></td>
<td></td>
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<tr>
<td>Private Circuits</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>(Gross) (Intra)</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td><strong>Depreciation</strong></td>
<td></td>
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<tr>
<td>Depreciation</td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

Note: Only BT’s cost/revenue categories containing amounts other than £Nil are shown.

A4.55 Ofcom also received clarifications in respect of specific revenue and cost categories and has made a number of adjustments as detailed below.
Analysis of costs into acquisition and non-acquisition components

A4.56 In order to ensure the appropriate treatment of customer acquisition costs in its economic analysis of BT Broadband (customer acquisition costs are amortised in the Adjusted Accounts), Ofcom has added two additional cost categories in its analysis both of which relate to SGA costs and re-allocated certain costs to these categories: marketing - acquisition cost component; and SGA acquisition costs.

A4.57 For marketing and related costs, Ofcom has assumed that these costs were incurred with the principal purpose of acquiring new subscribers.

A4.58 For other SGA costs, Ofcom has assumed that where there is insufficient information to permit it to categorise costs consistently between periods, these costs should be included in the ‘Other BT Supplier Costs’ category and treated as the costs of servicing and retaining subscribers.

A4.59 Non-Marcomms costs incurred in relation to the acquisition of new subscribers are allocated to ‘SGA acquisition costs’.

Additional SGA Costs

A4.60 BT management accounts between April 2002 and March 2004 show Additional SGA costs as a memorandum item (i.e. details of these costs have not been included in the profit and loss account). Additional SGA costs comprise CCC and Marcomms (‘marketing and communications’) costs which are discussed below.

CCC costs

A4.61 In relation to CCC costs, BT explained that “charges were raised in the BTB Management Accounts for the Broadband Repair and Service Desks. No charges were raised for Broadband Sales and Order Management Desks and for CCC training, which were included in AS accounts.”

A4.62 BT also explained that “[>]<”.  

A4.63 However, it is Ofcom’s opinion that these CCC costs relating to sales and Order Management Desks are relevant to the analysis and should therefore be included in the Adjusted Accounts. The fact that staff would be employed “in other areas” may mean that they do not represent costs incremental to the BT Group, but if the staff could alternatively be used on other products then their costs can be regarded as incremental to BT’s consumer broadband business and should therefore be included in the analysis.

A4.64 Ofcom has included the Additional CCC costs for the 24 months to March 2004 as acquisition costs under SGA acquisition costs. This treatment is consistent with that of OMD and CCC Sales costs found in the management accounts in subsequent periods.

Marcomms costs

A4.65 In relation to Marcomms costs, BT stated that “the additional marcomms relate to the [>]<”.

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A4.66  Ofcom has included those costs under Marketing Acquisition costs on the basis that the costs relate to marketing of broadband.

Additional SGA for 2004/5

A4.67  Ofcom’s reconciliation of management accounts to regulatory accounts shows that the relevant additional SG&A costs in 2004/5 were incorporated into either the management accounts or the regulatory accounts and that there is no need to extrapolate Marcomms and CCC costs for the financial year to 31 March 2005.

‘Marcomms’ costs category

A4.68  The costs charged under BT Broadband ‘Marcomms’ principally comprise marketing and advertising expenditure including the costs of producing and delivering campaigns using TV, radio, the press and direct mail channels.

A4.69  For the period April 2002 to May 2004, BT provided Ofcom with an analysis of advertising and marketing expenditure stating which amounts were incurred for the purpose of generating new subscribers and which amounts were incurred for the purpose of retaining existing subscribers.²⁰⁵

A4.70  BT explained that “all funds were focused on acquisition and awareness”²⁰⁶ until September 2003, and identified amounts spent on retaining existing customers from October 2003 to May 2004. Ofcom has adopted this breakdown in its Adjusted Accounts and allocated acquisition costs to the ‘Marcomms – Acquisition Component’ cost category and retention costs to the ‘Marcomms – Non Acquisition Component’ cost category.

‘Central Plus’ costs category

A4.71  Ofcom understands that Central Plus costs are network costs which include costs relating to both connection and rental costs.

A4.72  BT provided a breakdown of network costs from June to September 2004 based on an “equal allocation across total volumes” of BT Wholesale Invoices.²⁰⁷ Ofcom Adjusted Accounts adopt this breakdown under the Central Plus – Connection and Central Plus – Rental cost categories.

A4.73  Ofcom extrapolated this breakdown for the period October 2004 to March 2005.

‘Unallocated task’ cost category

A4.74  Ofcom obtained details of the costs allocated to this category in BT’s management accounts.²⁰⁸ Underlying costs relate to ‘Service Desk, Repair Desk and THD [technical help desk] & [>] costs’.

A4.75  These costs have been reallocated to various Ofcom cost categories depending on the nature of costs incurred: Service, Repair and THD relate to recurring call centre costs and have been allocated to Customer Call Centre Costs and [>] costs relate to licence fees and have been allocated to ‘Other BT Supplier Costs’ category.

²⁰⁵ BT’s response to Question 6 of Ofcom’s 11th notice under section 26 of the Act, dated 30 June 2004.
²⁰⁶ BT’s response to Question 6 of Ofcom’s 11th notice under section 26 of the Act, dated 30 June 2004.
²⁰⁷ BT’s response to Question 5 c) of Ofcom’s 15th notice under section 26 of the Act, dated 22 December 2004.
²⁰⁸ BT’s response to Ofcom’s informal information request of 22 June 2004
‘Fulfilment / accommodation’ cost category

A4.76 Fulfilment and accommodation costs\textsuperscript{209} were charged to the Business Services cost category between March 2003 and September 2003. ‘Fulfilment’ refers to the costs of meeting a new customer order.

A4.77 Between October 2003 and May 2004, fulfilment costs were categorised under the BT Supplier Cost category and under procurement, also assumed to be included within the BT Supplier Cost category.

A4.78 As of June 2004, fulfilment costs were categorised under CPE costs.

A4.79 For consistency of treatment and to reflect that these costs relate to the acquisition of new customers, Ofcom has allocated all fulfilment costs from April 2002 to March 2005 to the CPE cost category.

A4.80 Furthermore, fulfilment costs have generally been accrued on receipt of invoice rather than in the period in which costs were incurred. BT provided an analysis of the actual monthly charge between April 2002 and May 2004 which Ofcom substituted in its analysis in place of the amounts charged in the management accounts,\textsuperscript{210} as summarised on Table A4.7 below.

Table A4.7: Fulfilment cost allocations

<table>
<thead>
<tr>
<th>Amounts in £ thousand</th>
<th>2002/3</th>
<th>2003/4</th>
<th>Apr-May-04</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fulfilment costs per management accounts</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Business Services</td>
<td>[X]</td>
<td></td>
<td>[X]</td>
</tr>
<tr>
<td>- BT Other Suppliers</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
</tr>
<tr>
<td>Fulfilment costs per Ofcom</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
</tr>
<tr>
<td>- CPE</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
</tr>
</tbody>
</table>

‘[X] Licence Fee’ cost category

A4.81 [X] is an automated web-based helpdesk facility. BT explained that “the [X] licence fee was £[X] million paid in January 2003 […] The licence runs from 01/10/02 – 30/09/04”.\textsuperscript{211}

A4.82 Ofcom’s analysis identified amounts charged of £[X] million in January 2003 in respect of [X] licence fees relating to BT’s web based customer help facility. As such, these costs benefit more than one month’s subscribers and Ofcom has therefore decided that they are more appropriately treated on an accruals basis. Accordingly Ofcom adjusted BT’s costs to spread these costs evenly over the 24 months duration of the contract, starting in October 2002.

‘BT.com’ cost category

A4.83 BT explained that BT.com costs are “for the development of BT.com to allow BTBB customers to transact online, e.g. purchase BB”.\textsuperscript{212}

\textsuperscript{209} BT’s response to Ofcom’s informal information request of 22 June 2004.
\textsuperscript{210} BT’s response to Question 8 of 11th notice under section 26 of the Act, dated 30 June 2004.
\textsuperscript{211} BT’s response to Ofcom’s Informal Question 4 of 19 July 2004.
\textsuperscript{212} Response to Ofcom’s informal question 5 of 19 July 2004.
Initially these costs were not charged to BT Broadband. However a cross-charge was made in March 2003 as part of the year end procedures. BT notes that this development activity took place throughout 2002/3. However given that BT Broadband was not formally launched until the Autumn of 2002 and subscriber numbers prior to September are insignificant, this cost has been assumed to have been incurred on a straight line basis over the seven month period to March 2003.

Ofcom noted that BT re-categorised these costs to “the development line of the P&L” in 2003/4 and therefore Ofcom transferred all BT.com related costs to the Development cost category.

‘CRM desktop functionality’ cost category

BT explained that these CRM costs were “for agents to manage customers throughout the full customer lifecycle and the development of the Hub capability to automate order provision and management. Costs relate to the launch of BTBB”.

Initially these costs were not charged to broadband accounts. However, a subsequent cross-charge was made in December 2002. BT notes that this development activity took place throughout 2002/3. However given that BT Broadband was not formally launched until the Autumn of 2002 and subscriber numbers prior to September are insignificant, this cost has been assumed to have been incurred on a straight line basis over the seven month period to March 2003.

‘Order Management Desk’ cost category

The costs attributable to the Order Management Desk (“OMD”) were included within the Customer Contact Centre cost category until May 2004. BT provided a breakdown of amounts relating to OMD which Ofcom has allocated to SGA Acquisition costs as these costs relate to the acquisition of new subscribers.

As of June 2004, OMD costs are identified separately in the Profit and Loss accounts supplied by BT. These costs were also reallocated to SGA Acquisition costs.

Bad Debt

BT Broadband's management accounts [3<].

As BT Broadband is billed on BT’s 'blue bill' to customers covering all services, any bad debt arising reflects both broadband and other telephony services.

BT wrote off amounts of between [3<]% and [3<]% of revenue for April and May 2004, resulting in an average write-off of [3<]% of revenue. BT notes that of the amounts written off, typically [3<]% is subsequently recovered. Ofcom has therefore reduced the write off by [3<]% from [3<]% to [3<]%.

Ofcom has calculated a bad debt cost of [3<]% of total revenue before adjustments and charged it to a new ‘Bad Debt’ cost category in the case of rental revenue and to SGA acquisition costs in the case of acquisition costs.

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213 Response to Ofcom's informal information request of 22 June 2004.
A4.94 This increased costs in Ofcom’s analysis by £[^<^] million.

**BT Broadband Basic costs**

A4.95 Broadband Basic costs are now included as part of Ofcom’s review of BT Broadband services.

**Customer Premises Equipment (“CPE”)**

A4.96 The CPE costs in BT’s management accounts in each month represents the cost of equipment purchased from suppliers rather than the cost of equipment for customers joining in that month. As a result, the average cost per new joiner shown in the management accounts is highly variable as illustrated in Figure A4.8 below. In Ofcom’s view this does not reflect actual variations in the underlying unit cost, but rather adjusting accounting entries, Ofcom has therefore made an adjustment to smooth out the costs for 2002/3 and 2003/4 to reflect a more reasonable actual unit cost. As the variations in 2004/5 were not as significant no adjustment was made.

**Figure A4.8: Unitised CPE costs for BT Broadband**

[^<^]

A4.97 BT explained that “in 02/03 the charging system was not set up, so estimates were charged to the P&L rather than actual costs. The system that was in place was unable to separate CPE charges and BTB was charged for additional products. This continued for the first half of 03/04. Since then, a new system has been introduced and only the CPE charges relating to BTB have been charged to BTB.”

A4.98 In relation to 2004/5, BT explained that “the CPE postings relate to the cost of modems supplied to customers. The credit in June 2004 is believed to be a correction of prior months overcharges (the costs within the management accounts for April 2004 and May 2004 were significantly higher than the subsequent trend), to ensure the year to date position was accurately recorded.”

**Other intra**

A4.99 These costs are technical helpdesk costs which are charged to Other Intra before being reallocated to Other BT Suppliers in a later period.

A4.100 Ofcom has reallocated these costs to Other BT Suppliers.

**Network charges**

A4.101 Ofcom noted a £[^<^] million charge under ‘Other’ cost of sales in June 2004. BT explained that this was “a one-off charge from BT Wholesale representing a correction of an under-accrual of prior years’ network charges.”

A4.102 Ofcom has spread the charge over an assumed fifteen month period between March 2003 and May 2004.

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[^218]: Response to Question 5 e) II) of Ofcom’s 15th notice under section 26 of the Act, dated 22 December 2004.
[^220]: Response to Question 5 e) III) of Ofcom’s 15th notice under section 26 of the Act, dated 22 December 2004.
Development costs

A4.103 BT explained that “BT Broadband development costs to date [22 June 2004] have been treated as cash and not capitalised or amortised.”

A4.104 However, Ofcom noted that BT capitalised amounts relating to development costs in September and November 2004. Ofcom bases its Adjusted Accounts on an incurred basis, and amortises systems and development costs in aggregate and has therefore reversed BT’s adjustment at this level in the accounts.

Marketing Launch cost

A4.105 Ofcom noted a spike on costs of £[X] million in October 2002 under Marcomms and assumes that this relates to a one-off launch or advertising content costs with an on-going benefit.

A4.106 Ofcom has assumed that the benefits of these costs would last for three months and has therefore spread this amount between October and December 2002.

Call Centre Costs

A4.107 Ofcom understands that call centre costs relate to five types of activity:

<table>
<thead>
<tr>
<th>Cost type</th>
<th>Provider</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales</td>
<td>Acquisition</td>
</tr>
<tr>
<td>Order management desk</td>
<td>Acquisition</td>
</tr>
<tr>
<td>Technical helpdesk</td>
<td>Recurring</td>
</tr>
<tr>
<td>Service</td>
<td>Recurring</td>
</tr>
<tr>
<td>Repair</td>
<td>Recurring</td>
</tr>
</tbody>
</table>

A4.108 Call centre costs for BT Broadband are recorded in the management accounts under the ‘Helpdesk’, ‘Customer Service’ and ‘Order Management Desk’ cost categories.

A4.109 Call centre costs relate to CCC costs and the Order Management Desk costs under ‘SGA Acquisition’ cost categories.

A4.110 Ofcom used the same methodology to make an adjustment in respect of call centre costs to that made for BT Openworld Broadband (set out at paragraphs A4.34 to A4.36 above).

Free subscription special offer

A4.111 Ofcom has reallocated rental revenues foregone in respect of free subscription offers to acquisition costs on the basis that this can reasonably be treated as a subscriber acquisition cost.

Summary of Ofcom adjustments to Management Accounts

A4.112 The impact of the adjustments made by Ofcom to the management accounts of BT Broadband is set out in Table A4.9 below.

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221 Response to Ofcom’s Informal Questions dated 22 June 2004.
222 Responses to Question 1 of Ofcom’s 14th notice under section 26 of the Act dated 9 November 2004 and to Question 1 (f) of Ofcom’s 16th notice under section 26 of the Act, dated 25 January 2005.
223 BT’s response to Question 5 (iii) of Ofcom’s 17th notice under section 26 of the Act, dated 18 February 2005.
### Table A4.9: Technical adjustments to BT Broadband Management Accounts

<table>
<thead>
<tr>
<th>Description</th>
<th>£m</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inclusion of bad debt charge</td>
<td>[X]</td>
</tr>
<tr>
<td>Revise CPE costs to actual costs incurred</td>
<td>[X]</td>
</tr>
<tr>
<td>Replace Unallocated Task by actual costs incurred</td>
<td>[X]</td>
</tr>
<tr>
<td>Reverse amortisation of Development costs</td>
<td>[X]</td>
</tr>
<tr>
<td>Reduction in EBIT</td>
<td>[X]</td>
</tr>
</tbody>
</table>

*Source: Ofcom analysis*\(^{233}\)*NB Items may not sum to total because of rounding differences*

### Regulatory accounts and additional relevant costs

A4.113   Ofcom used the same methodology to make an adjustment in respect of additional relevant regulatory costs to that used for BT Openworld Broadband (set out at paragraphs A4.43 to A4.53 above).

\(^{233}\) BT Broadband Management Accounts Data.xls worksheet ‘BTBB tech adj’.
Table A4.10: BT’s Regulatory accounts 2002/3

<table>
<thead>
<tr>
<th>£’000</th>
<th>Total</th>
<th>BT Yahoo Consumer</th>
<th>BT Yahoo Business</th>
<th>BT Broadband</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total loss per management accounts (per BT’s reconciliation)</td>
<td>(£&lt;i&gt;)</td>
<td>(£&lt;i&gt;)</td>
<td>(£&lt;i&gt;)</td>
<td>(£&lt;i&gt;)</td>
</tr>
<tr>
<td>Net additional costs not included in mgt a/c</td>
<td>(£&lt;i&gt;)</td>
<td>(£&lt;i&gt;)</td>
<td>(£&lt;i&gt;)</td>
<td>(£&lt;i&gt;)</td>
</tr>
<tr>
<td>Total loss per regulatory accounts</td>
<td>(£&lt;i&gt;)</td>
<td>(£&lt;i&gt;)</td>
<td>(£&lt;i&gt;)</td>
<td>(£&lt;i&gt;)</td>
</tr>
</tbody>
</table>

### Revenue

<table>
<thead>
<tr>
<th>Reconciling items: BTOW</th>
<th>Total</th>
<th>BT Yahoo Consumer</th>
<th>BT Yahoo Business</th>
<th>BT Broadband</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buy sell</td>
<td>(£&lt;i&gt;)</td>
<td>(£&lt;i&gt;)</td>
<td>(£&lt;i&gt;)</td>
<td>(£&lt;i&gt;)</td>
</tr>
<tr>
<td>Other BB revenues allocated to product</td>
<td>(£&lt;i&gt;)</td>
<td>(£&lt;i&gt;)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Reconciling items: BT Broadband</th>
<th>Total</th>
<th>BT Yahoo Consumer</th>
<th>BT Yahoo Business</th>
<th>BT Broadband</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connection</td>
<td>(£&lt;i&gt;)</td>
<td>(£&lt;i&gt;)</td>
<td></td>
<td></td>
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<tr>
<td>Hardware</td>
<td>(£&lt;i&gt;)</td>
<td>(£&lt;i&gt;)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rental</td>
<td>(£&lt;i&gt;)</td>
<td>(£&lt;i&gt;)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Employee Discount</td>
<td>(£&lt;i&gt;)</td>
<td>(£&lt;i&gt;)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other discounts/rebates/returns</td>
<td>(£&lt;i&gt;)</td>
<td>(£&lt;i&gt;)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>(£&lt;i&gt;)</td>
<td>(£&lt;i&gt;)</td>
<td>(£&lt;i&gt;)</td>
<td>(£&lt;i&gt;)</td>
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</tbody>
</table>

### Costs

<table>
<thead>
<tr>
<th>Reconciling items: BTOW</th>
<th>Total</th>
<th>BT Yahoo Consumer</th>
<th>BT Yahoo Business</th>
<th>BT Broadband</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buy/sell</td>
<td>(£&lt;i&gt;)</td>
<td>(£&lt;i&gt;)</td>
<td>(£&lt;i&gt;)</td>
<td>(£&lt;i&gt;)</td>
</tr>
<tr>
<td>Self Help Tool supplied by BTOW</td>
<td>(£&lt;i&gt;)</td>
<td>(£&lt;i&gt;)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other BB costs allocated to product</td>
<td>(£&lt;i&gt;)</td>
<td>(£&lt;i&gt;)</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Reconciling items: BT Broadband</th>
<th>Total</th>
<th>BT Yahoo Consumer</th>
<th>BT Yahoo Business</th>
<th>BT Broadband</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost of sales</td>
<td>(£&lt;i&gt;)</td>
<td>(£&lt;i&gt;)</td>
<td>(£&lt;i&gt;)</td>
<td>(£&lt;i&gt;)</td>
</tr>
<tr>
<td>Connection</td>
<td>(£&lt;i&gt;)</td>
<td>(£&lt;i&gt;)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rental</td>
<td>(£&lt;i&gt;)</td>
<td>(£&lt;i&gt;)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adjustments</td>
<td>(£&lt;i&gt;)</td>
<td>(£&lt;i&gt;)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Central plus connection</td>
<td>(£&lt;i&gt;)</td>
<td>(£&lt;i&gt;)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Central plus rental</td>
<td>(£&lt;i&gt;)</td>
<td>(£&lt;i&gt;)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hardware</td>
<td>(£&lt;i&gt;)</td>
<td>(£&lt;i&gt;)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SGA</td>
<td>(£&lt;i&gt;)</td>
<td>(£&lt;i&gt;)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total pay</td>
<td>(£&lt;i&gt;)</td>
<td>(£&lt;i&gt;)</td>
<td>(£&lt;i&gt;)</td>
<td>(£&lt;i&gt;)</td>
</tr>
<tr>
<td>Marcomms - acquisition component</td>
<td>(£&lt;i&gt;)</td>
<td>(£&lt;i&gt;)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other externals</td>
<td>(£&lt;i&gt;)</td>
<td>(£&lt;i&gt;)</td>
<td>(£&lt;i&gt;)</td>
<td>(£&lt;i&gt;)</td>
</tr>
<tr>
<td>BT.com (intra)</td>
<td>(£&lt;i&gt;)</td>
<td>(£&lt;i&gt;)</td>
<td>(£&lt;i&gt;)</td>
<td>(£&lt;i&gt;)</td>
</tr>
<tr>
<td>Cust Call centre</td>
<td>(£&lt;i&gt;)</td>
<td>(£&lt;i&gt;)</td>
<td>(£&lt;i&gt;)</td>
<td>(£&lt;i&gt;)</td>
</tr>
<tr>
<td>Cust Call centre Private Circuits (gross)</td>
<td>(£&lt;i&gt;)</td>
<td>(£&lt;i&gt;)</td>
<td>(£&lt;i&gt;)</td>
<td>(£&lt;i&gt;)</td>
</tr>
<tr>
<td>Business services</td>
<td>(£&lt;i&gt;)</td>
<td>(£&lt;i&gt;)</td>
<td>(£&lt;i&gt;)</td>
<td>(£&lt;i&gt;)</td>
</tr>
<tr>
<td>Development - internal</td>
<td>(£&lt;i&gt;)</td>
<td>(£&lt;i&gt;)</td>
<td>(£&lt;i&gt;)</td>
<td>(£&lt;i&gt;)</td>
</tr>
<tr>
<td>Development - external</td>
<td>(£&lt;i&gt;)</td>
<td>(£&lt;i&gt;)</td>
<td>(£&lt;i&gt;)</td>
<td>(£&lt;i&gt;)</td>
</tr>
<tr>
<td>Other BT Supplier costs</td>
<td>(£&lt;i&gt;)</td>
<td>(£&lt;i&gt;)</td>
<td>(£&lt;i&gt;)</td>
<td>(£&lt;i&gt;)</td>
</tr>
<tr>
<td>Total</td>
<td>(£&lt;i&gt;)</td>
<td>(£&lt;i&gt;)</td>
<td>(£&lt;i&gt;)</td>
<td>(£&lt;i&gt;)</td>
</tr>
</tbody>
</table>

### Non-infringement Decision
Regulatory accounts 2003/4

A4.114 BT provided Ofcom with a reconciliation of management accounts to regulatory AS costs for the financial year ended 31 March 2004 as well as further detailed explanations and information on the main reconciling items.

A4.115 Table A4.11 below shows the reconciliation between BT’s management and regulatory accounts for 2003/4.

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225 Response to Question 21 of Ofcom’s 15th notice under section 26 of the Act, dated 22 December 2004.
226 Response to Questions 1-3 of Ofcom’s 17th notice under section 26 of the Act, dated 18 February 2005.
Table A4.11: Reconciliation between BT’s management and regulatory accounts
2003/4

<table>
<thead>
<tr>
<th>£’000</th>
<th>Total</th>
<th>BT Openworld Consumer</th>
<th>BT Openworld Business</th>
<th>BT Broadband</th>
<th>Unallocated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total loss per management accounts provided to Ofcom</td>
<td>(X)</td>
<td>(X)</td>
<td>(X)</td>
<td>(X)</td>
<td>(X)</td>
</tr>
<tr>
<td>Unexplained further expenses</td>
<td>(X)</td>
<td>(X)</td>
<td>(X)</td>
<td>(X)</td>
<td>(X)</td>
</tr>
<tr>
<td>Total loss per management accounts (as per BT’s reconciliation)</td>
<td>(X)</td>
<td>(X)</td>
<td>(X)</td>
<td>(X)</td>
<td>(X)</td>
</tr>
<tr>
<td>Net costs not included in mgt accounts</td>
<td>(X)</td>
<td>(X)</td>
<td>(X)</td>
<td>(X)</td>
<td>(X)</td>
</tr>
<tr>
<td>Total loss per regulatory accounts</td>
<td>(X)</td>
<td>(X)</td>
<td>(X)</td>
<td>(X)</td>
<td>(X)</td>
</tr>
</tbody>
</table>

**Revenue**

<table>
<thead>
<tr>
<th></th>
<th>Total</th>
<th>BT Openworld Consumer</th>
<th>BT Openworld Business</th>
<th>BT Broadband</th>
<th>Unallocated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total revenues per Management Accounts</td>
<td>(X)</td>
<td>(X)</td>
<td>(X)</td>
<td>(X)</td>
<td>(X)</td>
</tr>
<tr>
<td>Intra revenue contra’d off against costs</td>
<td>(X)</td>
<td>(X)</td>
<td>(X)</td>
<td>(X)</td>
<td>(X)</td>
</tr>
<tr>
<td>Other BT Yahoo! Revenue adjustments</td>
<td>(X)</td>
<td>(X)</td>
<td>(X)</td>
<td>(X)</td>
<td>(X)</td>
</tr>
<tr>
<td>Other BT Retail Revenue adjustments</td>
<td>(X)</td>
<td>(X)</td>
<td>(X)</td>
<td>(X)</td>
<td>(X)</td>
</tr>
<tr>
<td>Total reconciling items</td>
<td>(X)</td>
<td>(X)</td>
<td>(X)</td>
<td>(X)</td>
<td>(X)</td>
</tr>
</tbody>
</table>

**Costs**

<table>
<thead>
<tr>
<th></th>
<th>Total</th>
<th>BT Openworld Consumer</th>
<th>BT Openworld Business</th>
<th>BT Broadband</th>
<th>Unallocated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total costs per Management Accounts</td>
<td>(X)</td>
<td>(X)</td>
<td>(X)</td>
<td>(X)</td>
<td>(X)</td>
</tr>
<tr>
<td>Intra BT Trading contras</td>
<td>(X)</td>
<td>(X)</td>
<td>(X)</td>
<td>(X)</td>
<td>(X)</td>
</tr>
<tr>
<td>CCC correction</td>
<td>(X)</td>
<td>(X)</td>
<td>(X)</td>
<td>(X)</td>
<td>(X)</td>
</tr>
<tr>
<td>Corporate &amp; Central overheads</td>
<td>(X)</td>
<td>(X)</td>
<td>(X)</td>
<td>(X)</td>
<td>(X)</td>
</tr>
<tr>
<td>Group Costs that are not included in Management Accounts</td>
<td>(X)</td>
<td>(X)</td>
<td>(X)</td>
<td>(X)</td>
<td>(X)</td>
</tr>
<tr>
<td>Central Costs that are not included in Management Accounts</td>
<td>(X)</td>
<td>(X)</td>
<td>(X)</td>
<td>(X)</td>
<td>(X)</td>
</tr>
<tr>
<td>Business &amp; Non broadband related costs</td>
<td>(X)</td>
<td>(X)</td>
<td>(X)</td>
<td>(X)</td>
<td>(X)</td>
</tr>
<tr>
<td>Costs related to Sales to Business Customers</td>
<td>(X)</td>
<td>(X)</td>
<td>(X)</td>
<td>(X)</td>
<td>(X)</td>
</tr>
<tr>
<td>Value Added Services Depreciation Costs</td>
<td>(X)</td>
<td>(X)</td>
<td>(X)</td>
<td>(X)</td>
<td>(X)</td>
</tr>
<tr>
<td>Other differences</td>
<td>(X)</td>
<td>(X)</td>
<td>(X)</td>
<td>(X)</td>
<td>(X)</td>
</tr>
<tr>
<td>Cost of Sales difference</td>
<td>(X)</td>
<td>(X)</td>
<td>(X)</td>
<td>(X)</td>
<td>(X)</td>
</tr>
<tr>
<td>Customer Contact Centre difference</td>
<td>(X)</td>
<td>(X)</td>
<td>(X)</td>
<td>(X)</td>
<td>(X)</td>
</tr>
<tr>
<td>Marketing &amp; Sales Differences</td>
<td>(X)</td>
<td>(X)</td>
<td>(X)</td>
<td>(X)</td>
<td>(X)</td>
</tr>
<tr>
<td>Computing &amp; Development Differences</td>
<td>(X)</td>
<td>(X)</td>
<td>(X)</td>
<td>(X)</td>
<td>(X)</td>
</tr>
<tr>
<td>Costs in Management Accounts not identified in AS</td>
<td>(X)</td>
<td>(X)</td>
<td>(X)</td>
<td>(X)</td>
<td>(X)</td>
</tr>
<tr>
<td>Small differences between AS &amp; Management accounts</td>
<td>(X)</td>
<td>(X)</td>
<td>(X)</td>
<td>(X)</td>
<td>(X)</td>
</tr>
<tr>
<td>Unexplained Difference between AS &amp; Management Accounts</td>
<td>(X)</td>
<td>(X)</td>
<td>(X)</td>
<td>(X)</td>
<td>(X)</td>
</tr>
<tr>
<td>Total reconciling items</td>
<td>(X)</td>
<td>(X)</td>
<td>(X)</td>
<td>(X)</td>
<td>(X)</td>
</tr>
</tbody>
</table>

Source: BT response to Question 2 of 17th section 26 Notice dated 18 February 2005

A4.116 In Ofcom’s view, the following costs are relevant to its investigation:

- “Other BT Retail Revenue adjustments” comprises “Northern Ireland & BT Business Revenues, Employee Discounts & Returns, Trading Margin Retained
in Management Accounts by Retail channel”. It has been included under Other discounts/rebates/returns.

- “Customer Contact Centre Reduction in AS Charges” is a “more detailed analysis of AS CCC data at a lower level of OUC [Organisational Unit Code] has revealed an estimated reduction to BT Retail Broadband products of £[>£]m”. This has been included under Customer Contact Centre (Intra).

BT provided a breakdown of costs by OUC and explained:

“Organisational Unit Code (M7N3P) carries out call centre work on a dedicated basis for BT Broadband. Its costs were therefore allocated directly to the BT Broadband product and were considered as part of the overall call centre activity costs, and attributed pro-rata to activity levels observed from a sample of approximately 300,000 call records (the customer service representative in the call centre gives each call a reason code which is captured in the call centre systems).

The management accounts, take into account work carried by M73NP for core BT activities.

To make the regulatory accounts consistent with the management accounts, it is therefore necessary to deduct the directly allocated costs and re-apportion them on the basis of the overall call centre activity sample. This has a knock-on effect, in that call centre overhead / indirect costs are attributed according to the destination of the direct costs, so that as direct cost attribution reduces, so too does the indirect cost.

We note that strictly the regulatory accounting treatment will result in some overstatement of the amount of cost attributed to the BT Broadband product, since the activity within OUC M7N3P forms part of the total call centre activity that is sampled.”

- “Central Costs that are not included in Management Accounts” relate to “Retail Leadership Team. Miscellaneous small apportionments from Retail Divisions plus New Start Redundancy Charge. Lower Direct Pay Costs pointed to BT Retail Broadband from CCC would have a knock on effect of lowering Central Overhead Costs”. These have been included under Pay, team costs, contractors.

BT provided a breakdown of Central Costs not included in Management Accounts by categories. Ofcom excluded amounts of £[>£] million in respect of redundancy payments as BT explained that “New Start Redundancy Charge is the 2003/4 payment in relation to BT’s current voluntary scheme”.

- “Costs related to Sales to Business Customers” relate to “Wholesale, Global Services, Major Business & BT Business Costs”. They have been included under Other Externals.

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227 Response to Question 3(i) of Ofcom’s 17th notice under section 26 of the Act, dated 18 February 2005.
228 Response to Question 3(iii) of Ofcom’s 17th notice under section 26 of the Act, dated 18 February 2005.
229 Response to Question 3(iii-b) of Ofcom’s 17th notice under section 26 of the Act, dated 18 February 2005.
• “Cost of Sales difference” represents “approx. 1% of total Cost of sales” and has been allocated to Rental costs.

• “Customer Contact Centre difference” arises as a result of “Management Account charge [being] based on agreed charges for work of identified CCC teams calculated on a transactional basis. AS charge is apportionment based on activity surveys & therefore includes costs from groups such as 150 (Residential Customer Enquiries) that are not included in Management Accounts.” Such costs have been included under Customer Contact Centre (Intra).

• “Computing & Development Differences” are because “AS charge is based on analysis of Projects that comprise BT Exact Charge for Computing & Development to LOBs. In addition to Broadband specific projects the AS Products were apportioned a share of costs spread on Retail Pay Overhead & other Retail Apportionments Bases.” These costs have been included under Development – External.

• “Small differences between AS & Management accounts” and “Unexplained Difference between AS & Management Accounts” have been included under Other Externals.

Regulatory accounts 2004/5

A4.117 BT has provided a reconciliation of management accounts to regulatory AS costs for the financial year ended 31 March 2005.\(^{230}\)

\(^{230}\) Response to Ofcom’s 19th notice under section 26 of the Act, dated 12 April 2007.
Table A4.12: Reconciliation of management accounts to regulatory AS costs for the financial year ended 31 March 2005

<table>
<thead>
<tr>
<th>£m</th>
<th>Residential broadband</th>
<th>Business broadband</th>
<th>Unallocated costs</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total loss per management accounts (per BT’s reconciliation)</td>
<td>-[X]</td>
<td>[X]</td>
<td>-[X]</td>
<td>-[X]</td>
</tr>
<tr>
<td>Net additional loss not included in mgt a/c</td>
<td>-[X]</td>
<td>-[X]</td>
<td>-[X]</td>
<td>-[X]</td>
</tr>
<tr>
<td>Total loss per regulatory accounts</td>
<td>-[X]</td>
<td>-[X]</td>
<td>-[X]</td>
<td>-[X]</td>
</tr>
<tr>
<td>Total revenues per Management Accounts</td>
<td>[X]</td>
<td>[X]</td>
<td></td>
<td>[X]</td>
</tr>
<tr>
<td>Reconciling items: various</td>
<td>[X]</td>
<td>[X]</td>
<td></td>
<td>[X]</td>
</tr>
<tr>
<td>Total revenues per regulatory accounts</td>
<td>[X]</td>
<td>[X]</td>
<td></td>
<td>[X]</td>
</tr>
<tr>
<td>Total costs per Management Accounts</td>
<td>[X]</td>
<td>[X]</td>
<td></td>
<td>[X]</td>
</tr>
<tr>
<td>Reconciling items:</td>
<td>[X]</td>
<td>[X]</td>
<td></td>
<td>[X]</td>
</tr>
<tr>
<td>Group Costs - Products share of Property, Chairman’s Office, Procurement etc.</td>
<td>[X]</td>
<td></td>
<td>-[X]</td>
<td>-[X]</td>
</tr>
<tr>
<td>Higher Computing/Development Costs in Regulatory Accounts</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
</tr>
<tr>
<td>Call Centre costs</td>
<td>-[X]</td>
<td>[X]</td>
<td></td>
<td>[X]</td>
</tr>
<tr>
<td>Bad Debt &amp; Billing</td>
<td>[X]</td>
<td>[X]</td>
<td>-[X]</td>
<td>-[X]</td>
</tr>
<tr>
<td>Human Resource</td>
<td>[X]</td>
<td></td>
<td></td>
<td>[X]</td>
</tr>
<tr>
<td>Retail Senior Management and Support costs</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>-[X]</td>
</tr>
<tr>
<td>Marketing and Sales</td>
<td>-[X]</td>
<td>[X]</td>
<td>[-X]</td>
<td>-[X]</td>
</tr>
<tr>
<td>Different treatment of transfers from other parts of BT e.g. transfers out treated as negative costs in one set of accounts and treated as Revenue in the other</td>
<td>[X]</td>
<td>[X]</td>
<td>-[X]</td>
<td>-[X]</td>
</tr>
<tr>
<td>3rd Party Maintenance</td>
<td>[X]</td>
<td>[X]</td>
<td></td>
<td>[X]</td>
</tr>
<tr>
<td>Total reconciling items</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
</tr>
<tr>
<td>Total costs per regulatory accounts</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
<td>[X]</td>
</tr>
</tbody>
</table>

A4.118 Group costs comprise allocations of costs incurred at the ‘BT Group’ level.

A4.119 In Ofcom’s view it is reasonable to assume that these costs are incurred in common with BT’s other services and can reasonably be regarded as common, even over the long run.

A4.120 Ofcom agreed the following figures in the reconciliation:

a) BT Consumer costs and revenues – agreed to monthly management accounts

b) Regulatory accounts totals – agreed to detailed listings from regulatory accounts system
c) Total management accounts costs to detailed breakdown of management accounts in regulatory accounts format

d) Reconciling items – agreed to BT’s analysis of cost categories showing total for management accounts and as per regulatory accounts

A4.121 As show Table A4.12 above, BT allocated the total differences between the regulatory and management accounts of £[<£] million to Consumer (£[<£] million), Business (£[<£] million) and Unallocated (£[<£] million) using the bases shown in Table A4.13 below:

### Table A4.13: Basis for allocation of reconciling items

<table>
<thead>
<tr>
<th>Cost</th>
<th>Basis for allocation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Computing and development costs</td>
<td>Three specific projects were identified: variable bandwidth services – unallocated, business products – allocated to business broadband and internet access developments – consumer broadband allocated [&lt;£]% of costs</td>
</tr>
<tr>
<td></td>
<td>Other projects were allocated on the basis of total costs</td>
</tr>
<tr>
<td>Call centre costs</td>
<td>Reconciling items mostly relate to call centre costs for business broadband services which were identified using the organisational unit code ‘MK’ for business services</td>
</tr>
<tr>
<td>Bad debt &amp; billing</td>
<td>Bad debt costs allocated in proportion to total revenue</td>
</tr>
<tr>
<td></td>
<td>Finance function costs (i.e. billing) allocated on the basis of total costs</td>
</tr>
<tr>
<td>Retail Senior Management and Support costs</td>
<td>Redundancy costs – unallocated</td>
</tr>
<tr>
<td></td>
<td>All other costs allocated on the basis of total costs</td>
</tr>
<tr>
<td>Marketing and sales</td>
<td>Costs related to business customers (identified by the organisational unit code) allocated to business services.</td>
</tr>
<tr>
<td></td>
<td>Other costs allocated on the basis of total marketing costs</td>
</tr>
<tr>
<td>Transfers</td>
<td>Costs related to business customers (identified by the organisational unit code) allocated to business services.</td>
</tr>
<tr>
<td></td>
<td>Other costs allocated on the basis of total costs</td>
</tr>
</tbody>
</table>

Source: BT response to Ofcom Q3 of 19th section 26 Request 26 April 2007

A4.122 In Ofcom’s view the basis for allocation of reconciling items between consumer and business broadband services is reasonable.

### Adjustments for economic depreciation

A4.123 BT’s management accounts charge certain costs to the profit and loss account in the period in which they are incurred. However, there are certain costs which can reasonably be expected to generate a benefit over a longer period than the month in which they are incurred and a calculation of the economic profit or losses in a period should take account of this by matching the costs to the periods in which they are expected to generate an economic benefit – the so called ‘path of cost recovery’.

A4.124 Ofcom’s analysis of BT’s cost stack identified three principal cost types for which deviations between accounting costs and economic costs were considered. These are the net costs of subscriber acquisition (including advertising and marketing costs), development costs and capital expenditure.
Subscriber acquisition costs

A4.125 Costs incurred by BT in acquiring subscriber include the following:

i) marketing and advertising incurred to attract a subscriber to the business;

ii) order management desk for processing new subscriber orders;

iii) connection to IPStream;

iv) connection to BT Central (BT Openworld Broadband) or BT Central Plus (BT Yahoo! and BT Broadband);

v) supply of CPE (if required by the subscriber);

vi) marketing fulfilment (the cost of supplying a customer with the welcome pack and delivering any CPE to be supplied); and

vii) the costs associated with special offers such as one month’s free subscription.

Development costs

A4.126 BT has invested in platforms and infrastructure necessary to deliver its services. Expenditure on development costs is not driven by customer numbers and is not consumed through use. Instead, once created it services a number of subscribers over its life. Unlike the investment in subscriber acquisition costs which is assumed to be completely consumed just as customers end their subscriptions, investment in development tends to be superseded by other new developments required to keep the business competitive. Investment in development costs is therefore consumed by time rather than use and consequently this investment has a finite life before it becomes redundant.

A4.127 Development costs can be considered to comprise strategic developments designed to create competitive advantage and ongoing development costs designed to prolong the life of existing assets. Ofcom would normally expect both types of expenditure to be capitalised and amortised over time reflecting the useful economic life of the asset. For BT Openworld Broadband, certain development costs are capitalised and written off over time whilst other development costs are expensed in the management accounts as incurred. For BT Broadband, development costs are written off as incurred in the management accounts.

A4.128 In the Adjusted Accounts, Ofcom has amortised development costs over three years. This is considered by Ofcom to be a reasonable period for amortising costs in respect of ‘new economy businesses’ in immature markets and complies with BT’s published accounting policies. Ofcom has made adjustments in respect of all development costs incurred by BT Broadband and all development costs charged as incurred by BT Openworld Broadband, capitalising and amortising these costs over three years on a straight-line basis.

Capital expenditure

A4.129 BT Openworld Broadband’s capital assets represent its share of the capital cost of the various IT platforms shared across BT Openworld’s ISP businesses which are

allocated in the management accounts. Platform costs are depreciated over three years in accordance with BT Group’s accounting policies and which in Ofcom’s view are a reasonable approximation to an economic cost path.

A4.130 Ofcom calculated a straight-line depreciation charge based on a three year life for BT Openworld’s fixed asset costs based on the cost of brought forward costs and expenditure during the period.

A4.131 No adjustment is required in respect of BT Broadband as the platform-related capital assets used by this business are made available to it by BT Wholesale within the BT Central Plus charge and charged on a usage basis which includes a depreciation charge based on a three-year life for the relevant assets.

Conversion to applicable cost standard

A4.132 The management accounts supplied by BT included certain allocated common costs. In Ofcom’s view the most appropriate cost standard to assess the sustainability of BT’s prices is LRAIC.

A4.133 The key difference between the financial statements prepared using FAC (as used in the regulatory accounts) and LRAIC costs is in the treatment of common costs. An allocation of common costs is included in FAC but excluded from a LRAIC analysis to the extent that these costs (or a proportion of them) are not incremental, even in the long run, to the service under consideration. As a result, costs in a FAC analysis will (to the extent there are any common costs) be higher than costs in a LRAIC analysis.

A4.134 In order to prepare a financial analysis based on LRAIC costs, Ofcom has considered each of BT’s cost categories and taken a view of the proportion of costs that can be considered as incremental to BT’s consumer broadband business over the long term.

A4.135 For each cost category three LRAIC proportions were considered:

i) ‘Max LRAIC’: This is Ofcom’s maximum assessment of LRAIC. It risks including some costs that would not be included in a true LRAIC assessment which could result in costs post adjustment being at a level greater than or equal to LRAIC.

ii) ‘Mid LRAIC’: Ofcom’s assessment of the adjustment most likely to result in the cost post adjustment being a reasonable approximation of true LRAIC, given the information available to it.

iii) ‘Min LRAIC’: This is Ofcom’s assessment of the likely minimum LRAIC level. This approach risks reducing costs to a level below true LRAIC and consequently may result in costs post adjustment being at a level less than or equal to true LRAIC.

A4.136 The adjustments required to convert management accounts data to LRAIC are set out in the BT Openworld Analysis Model and the BT Broadband Analysis Model.

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233 These are costs that are common to different BT products or services.
A4.137 Given the different nature of the additional relevant costs identified in the regulatory accounts, different LRIC proportions were considered for the proportion of each cost category derived from the management accounts or the regulatory accounts.

A4.138 In Ofcom’s view there are very few costs in BT’s management accounts for its broadband businesses that are not largely incremental. Arguably, certain development costs may relate to both consumer and business broadband services, and therefore can be regarded, at least in part as common to both services. Also, BT’s marketing of its broadband services will benefit both its business and consumer customers and a portion could therefore be regarded as common.

A4.139 Costs which are not subjected to a 100% LRIC adjustment in all scenarios are shown in Table A4.14 below.

**Table A4.14: LRIC Adjustment factors**

<table>
<thead>
<tr>
<th></th>
<th>Management accounts costs</th>
<th>Additional relevant</th>
<th>Average (range for different cost categories)</th>
<th>Management accounts costs</th>
<th>Additional relevant costs</th>
<th>Average</th>
<th>Management accounts costs</th>
<th>Additional relevant costs</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low LRIC Case</td>
<td>Mid LRIC Case</td>
<td>Hi LRIC Case</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Call centre costs</td>
<td>[X]%</td>
<td>[X]%</td>
<td>[X]%</td>
<td>[X]%</td>
<td>[X]%</td>
<td>[X]%</td>
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<td>[X]%</td>
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<tr>
<td>Bad debt costs</td>
<td>[X]%</td>
<td>[X]%</td>
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<td>[X]%</td>
<td>[X]%</td>
<td>[X]%</td>
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<td>[X]%</td>
</tr>
<tr>
<td>Development costs</td>
<td>[X]%</td>
<td>[X]%</td>
<td>[X]%</td>
<td>[X]%</td>
<td>[X]%</td>
<td>[X]%</td>
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<td>[X]%</td>
</tr>
<tr>
<td>Misc costs</td>
<td>[X]%</td>
<td>[X]%</td>
<td>[X]%</td>
<td>[X]%</td>
<td>[X]%</td>
<td>[X]%</td>
<td>[X]%</td>
<td>[X]%</td>
<td>[X]%</td>
</tr>
<tr>
<td>Marketing</td>
<td>[X]%</td>
<td>[X]%</td>
<td>[X]%</td>
<td>[X]%</td>
<td>[X]%</td>
<td>[X]%</td>
<td>[X]%</td>
<td>[X]%</td>
<td>[X]%</td>
</tr>
</tbody>
</table>

*Source: Ofcom estimates (BT Broadband Analysis.xls worksheet 16. LRIC allocations)*
Annex 5

Ofcom’s Adjusted NPV analysis

A5.1 Ofcom has made a number of adjustments to BT’s own NPV calculations, to reflect a methodological approach that is, in Ofcom’s view, more appropriate for assessing whether BT’s conduct in the period under review constituted an anti-competitive margin squeeze. The results derived following the application of these adjustments are referred to as the ‘Ofcom Adjusted NPVs’.

A5.2 This Annex sets out the methodology for Ofcom’s Adjusted NPV analysis which uses BT’s own financial models set out in its December 2003 and September 2004 Business Plans as its starting point, make a number of adjustments to costs and revenues to calculate NPVs for a range of time periods, churn rate assumptions and contestability scenarios.

A5.3 BT’s residential broadband business during the period under review was operated through two separate business units: BT Broadband (“BTBB”) and BT Openworld (“BTOW”) and separate management accounts and business plans were prepared for each of these two business units. Ofcom’s NPV analysis involves the calculation of Adjusted NPV calculations for each of the two business units and then consolidating them to form the ‘BT Portfolio’ NPV calculations.

A5.4 Ofcom’s NPV analysis was conducted using model operating in excel spreadsheets as shown in the simplified flow chart shown in Figure A5.1 below.
BT's own NPV Analysis

A5.5 BT typically prepares business plans to support its business decisions including a long term forecast of the financial performance of the product or service in the form of an NPV Analysis. BT usually includes both a 'Regulatory' and 'Commercial' cashflow projection. The Commercial forecast excludes past costs and represents the forward looking business decision, while the Regulatory cashflow incorporates historic results to present a measure of profitability over the life of the project.

A5.6 BT then prepares two NPV profit calculations for a particular decision, the 'Do Something' and 'Do Nothing' scenarios, which are used to compare two forecasts, and calculate an incremental NPV. Where BT made the decision to follow the 'Do Something' option, the incremental NPV was positive. Given that for any decision, past costs in the 'Do Something' and 'Do Nothing' scenario are generally the same, the incremental NPV for the Regulatory and Commercial cashflows is exactly the same.\(^\text{234}\)

A5.7 Ofcom considers BT's Regulatory 'Do Something' NPV calculations to be the most appropriate starting point for its analysis of whether BT was conducting a margin squeeze. However Ofcom has made a number of adjustments to BT's calculations, to reflect a methodological approach that is, in Ofcom's view, more appropriate in

\(^\text{234}\) An exception to this is that some BT Broadband plans included additional voice revenues generated from retaining voice customers who also purchased BT Broadband. The forecast voice revenues were excluded from the Regulatory cashflow, but included in the commercial cashflow.
the context of a test to determine whether or not BT’s conduct constituted an anti-competitive margin squeeze. The results derived following the application of these adjustments are referred to as the ‘Ofcom Adjusted NPVs’.

A5.8 The following sections describe the following adjustments made by Ofcom to BT’s regulatory NPV calculations in order to calculate the Ofcom Adjusted NPVs:

- Adjusting for actual costs
- Additional relevant costs identified in regulatory accounts
- Adjusting to LRAIC cost base
- Capital expenditure
- Working capital
- Terminal value
- Discount rate
- Treatment of Pre 2004 losses
- Churn rate assumptions
- Period of NPV calculations
- Increasing service margins.

**Adjusting for Actual Costs**

A5.9 Ofcom has adjusted the actual results used in BT’s plans to incorporate the adjustments Ofcom has made to BT’s management accounts to reallocate certain costs between categories and time periods and also to include the additional relevant costs as discussed in Annex 4.

**Additional costs identified in regulatory accounts**

A5.10 As discussed in Annex 4, Ofcom has identified a significant amount of relevant costs in BTs regulatory accounts which are not included in BT’s management accounts. These costs primarily relate to call centre costs and inter-company recharges for various centrally provided services. The relevance of additional costs is recognised in some, though not all, of BT’s forward looking business plans, which include an ‘AS Accounting Recharges’ cost line which, when included, is calculated at [3<]% of SGA costs.

A5.11 The level of forecast additional relevant costs included in the revised Ofcom NPV analysis is based on a fixed amount plus a smaller amount per subscriber, estimated using a line of best fit applied to actual additional relevant costs. The forecasts used in the December 2003 and September 2004 plans are different and are set out in each NPV model on the worksheet ‘Additional Costs’.

A5.12 This worksheet sets out the level of LRIC adjusted additional costs included by Ofcom in the NPV Analysis in the SOs that it issued, and compares it to the revised forecast for these costs. The difference between the two enters the NPV analysis at
sheet 5: Port + LRIC + AS, therefore reducing the relevant costs previously forecast.

A5.13 In the September 2004 plan the forecast for 2005/06 onwards is based on a fixed amount per annum of £[>] million plus £[>] per Broadband Subscriber.

A5.14 In the December 2003 plan the forecast for 2004/05 onwards is based on a fixed amount per annum of £[>] million plus £[>] per Broadband Subscriber.

Adjusting to LRAIC Cost Base

A5.15 BT’s business plans are based on costs and revenues stated on a fully allocated cost basis. Ofcom believes that the appropriate cost standard to use in this margin squeeze analysis is a LRAIC cost basis applied to all of BT’s consumer broadband services. Ofcom has therefore adjusted BT’s forecast costs downwards to a LRAIC cost basis using detailed LRAIC factors estimated in the Adjusted Accounts.

A5.16 A key LRAIC factor is that applied to those additional costs identified in the regulatory accounts but which are not included in the management accounts and are only partially provided for in BT’s business plans.

A5.17 Ofcom has applied a LRAIC adjustment factor of [>]% to the additional relevant costs in its Adjusted NPV Calculations. In Ofcom’s view this represents a reasonable estimate of the likely LRAIC proportion of the additional costs which BT ought reasonably to have included in its assessment.

Capital expenditure

A5.18 BT’s calculation of NPV for BT Openworld Broadband for September 2004 does not include any capital expenditure (in contrast the December 2003 plan assumed a constant £[>] per annum in all years). The forecast profit and loss account, however, includes a total depreciation charge over the period of the plan of £[>] million. In Ofcom's view the omission in the NPV calculation for any costs for future capital expenditure represents a material error.

A5.19 Ofcom has therefore included in its NPV calculations an estimate of BT Openworld’s capital expenditure (“capex”). Ofcom has included actual and assumed levels of capex for 2002/3 to 2004/5 and assumed future capex spend equivalent to BT’s assumed depreciation charge in subsequent years.

Working Capital

A5.20 Ofcom has not made any adjustments to BT’s NPV calculations in respect of working capital movements.

A5.21 Ofcom notes that BT’s assumptions for working capital are inconsistent. For example in the December 2003 Plan, BT makes no allowance for cashflows arising from changes in working capital in its cashflow forecasts for BT Openworld but for BT Broadband assumes a total positive cashflow of +£[>] million over the period of the plan. In contrast, BT’s September 2004 Plan assumes that the total cashflow of working capital over the life of the plan for BT Broadband is -£[>] million.

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235 As supplied by BT to Ofcom, in Stephen Dean’s e-mail to Hugh Kelly of 19 May 2004.

236 In a cashflow calculation it would be reasonable to include the cashflow implications of any changes in the balances of working capital items from the previous year.
A5.22 Ofcom notes that both receipts and payments for the major cashflow items for a retail ISP, customer subscriptions and wholesale network charges, are made in advance and therefore the effect on cashflows of any timing differences will be limited.

**Terminal value**

A5.23 BT did not include an allowance for the terminal value of the subscriber base or other assets in its business plans. Ofcom’s approach to terminal value is set out in Annex 7.

A5.24 In Ofcom’s view, it is appropriate to include in a discounted cash flow (“DCF”) analysis of future cash flows over a finite period a terminal value to allow for the value of relevant assets remaining at the end of the period. Failure to do so may lead to an overstatement of BT’s costs, and a corresponding understatement of relevant profits, primarily because the NPV calculation is truncated in the middle of the life of a significant asset – chiefly in this case the customer base.

A5.25 Ofcom notes that BT did not include a terminal value in its own NPV calculations in its business plans, but rather had longer NPV calculation periods. In its response to the third SO, BT sought to justify extending the period of the NPV analysis (beyond the six years assumed by Ofcom) on the grounds that:

“[Ofcom’s] approach…fails to appreciate that BT is not simply investing to acquire an identified customer base, which can be treated as a wasting asset. Rather, BT is investing in a valuable business, which will benefit from customer relationships, know-how, and organisational capabilities with economic lives greater than six years”.

A5.26 Ofcom’s view on the appropriate period of analysis is set out in the next section. However, to the extent that BT’s point that its subscriber base is not a “wasting asset” has any validity, Ofcom believes that the appropriate way to address it is by including a terminal value for the subscriber base at the end of the NPV calculation period, rather than by unreasonably extending the forecast period itself.

A5.27 It is therefore necessary to calculate an appropriate terminal value. As described in Section 4 and in more detail in Annex 7, Ofcom believes that the most appropriate method of doing so is the MEA approach, in which subscribers are valued at an amount equivalent to the costs of recruiting them through advertising etc. Ofcom does not completely reject in principle the usefulness of market values as advocated by BT but, for the reasons set out there, Ofcom does not consider the available market value based data sufficiently reliable.

A5.28 For the purposes of assessing the alleged margin squeeze from 1 January 2004 onwards, Ofcom considers that an appropriate MEA-based terminal value of subscribers may be derived from the forecast of acquisition costs contained in BT’s business plans. As BT does not make an explicit forecast of acquisition costs, Ofcom has derived an implied value based on the costs of marketing, BT wholesale connection and ADSL equipment projected in BT’s September 2004 business plan for 2005/6 onwards. The figure, derived in this way, and used by Ofcom to value
subscribers in situ at the end of the NPV calculation period under the central case assumptions, the results of which are described above, is £[\times] per subscriber.\textsuperscript{237}

Discount Rate

A5.29 The appropriate discount rate in an NPV calculation is the relevant cost of capital to the firm of the funds needed to finance the project. Typically, this is calculated as the WACC which takes into account the firm’s funding structure and the risk profile of the relevant project or business.

A5.30 BT prepared its own commercial and regulatory NPV calculations during the period of the investigation using a discount rate of 13.5%. This is the nominal pre-tax cost of capital for BT as a whole previously estimated by Oftel for regulatory purposes and reflects the cost of capital for the BT group as a whole.\textsuperscript{238}

A5.31 Ofcom notes that in August 2005, subsequent to the date of both BT’s December 2003 Plan and BT’s September 2004 Plan, Ofcom issued a statement: Ofcom’s approach to risk in the assessment of the cost of capital.\textsuperscript{239} The statement set out Ofcom’s approach to calculating an appropriate cost of capital to apply when considering BT’s pricing. In particular, the statement established that it is appropriate to distinguish two relevant costs of capital for BT, one relevant to its copper access business and one for all of its other businesses. The statement concluded that the relevant cost of capital for BT’s businesses other than those related to ‘copper access’ was 11.4%.\textsuperscript{240}

A5.32 In Ofcom’s view, 13.5% is a reasonable discount rate to apply to BT’s business plans in the context of considering BT’s behaviour during the period of the investigation for two reasons. Firstly, BT’s own pricing decisions were based on a cost of capital of 13.5%. Secondly, the revised rate of 11.4% was only established in 2005, after the preparation of BT’s plans and therefore it was not available at the time BT prepared its business plans.

A5.33 There may be some reasons to believe that consumer broadband faces more systematic risk than BT’s other non-copper access activities such as voice services and business data services which would indicate that a higher WACC is appropriate. For example, consumer broadband is a relatively new product, the pricing and levels of demand of which are arguably more uncertain than those for more established services and thus the underlying systematic risk is higher.

A5.34 On the other hand, a relatively large proportion of BT’s consumer broadband costs vary with its number of customers, i.e. they are not fixed. This factor might suggest that profits will be less sensitive to fluctuations in demand than is the case for many other BT products, suggesting that consumer broadband faces less systematic risk than BT’s non-copper access activities taken as a whole and that a lower WACC would be appropriate. It is not certain which of these two effects might be expected to dominate; and even if one effect were stronger than the other it would be difficult to quantify any such difference in risk. Ofcom therefore believes that it is reasonable to use its estimate of the cost of capital for BT as a whole in its NPV analysis.

\textsuperscript{237} There is some very small variation from year to year but the figure is approximately £[\times] in every year thereafter.

\textsuperscript{238} For more details on the calculation of this figure see http://www.ofcom.org.uk/static/archive/oftel/publications/pricing/pcr0101.htm#Annex%20E:%20Cost%20of%20capital.

\textsuperscript{239} http://stakeholders.ofcom.org.uk/consultations/cost_capital2/statement/#content.

\textsuperscript{240} Paragraph 8.19 of the statement
Treatment of Pre-2004 losses

A5.35 As set out in Section 4, in Ofcom’s view the assessment of BT’s profitability from January 2004 onwards should include the cost of assets existing as at January 2004, valued using a MEA approach.

A5.36 In its response to the third SO, BT argued that Ofcom had assessed its conduct over a period which was inconsistent with Ofcom’s own findings. BT stated:

“Para. 4.9 of SO3 claims that Ofcom has identified an abuse of dominance between June 2002 and December 2004. This statement is incorrect because Ofcom accepts that BT’s conduct prior to 1 January 2004 is objectively justified. Ofcom later corrects itself at para. 4.22 of SO3, which states that the infringement lasted 1 January 2004 to 31 December 2004.

“But by including pre-2004 cash-flows, Ofcom wrongly includes cash-flows which may have no causal relationship to the conduct during the period of the alleged abuse.

“An appropriate way of addressing this would be to exclude from the analysis all costs pre-2004 and all related post-1 January 2004 revenues – this would be in keeping with the logic of Ofcom’s approach to terminal value”.

A5.37 In other words, BT alleges that Ofcom had agreed that no abuse had occurred before 2004, but had wrongly included the losses from this period in its analysis of possible abuse in the period after 1 January 2004. In essence, BT’s argument is that since in the third SO, Ofcom found that prior to 1 January 2004, BT was not acting anti-competitively, any assessment of behaviour after that date should not depend on any activities prior to that date. While Ofcom found that BT had not infringed the Chapter II prohibition in respect of consumer broadband pricing decisions made in February 2002 (and published that decision in time for BT to incorporate the findings in preparation of its December 2003 business plan to apply from 1 January 2004), Ofcom does not accept that this means that it should exclude all costs incurred prior to 1 January 2004.

A5.38 Firstly, because part of BT’s behaviour after 1 January 2004 relates to the pricing of broadband to subscribers acquired prior to that date, Ofcom believes it is necessary to consider BT’s pricing of broadband to those subscribers since any meaningful assessment of the profitability of those existing customers should take account of their acquisition cost (a failure to do so would distort the measure of profitability of those subscribers). Ofcom believes it is necessary to include an acquisition cost for those customers in its assessment of BT’s profitability after 1 January 2004.

A5.39 Secondly, to the extent that BT’s activities prior to 1 January 2004 generated intangible assets with an ongoing benefit, then the value of these assets should also be included in an assessment of BT’s conduct after 1 January 2004, otherwise the assessment of profitability would not include all relevant costs which BT’s competitors would have to incur in order to compete.
Churn rate assumptions

A5.40 Annex 6 sets out Ofcom's assessment of the churn rate assumptions used by BT in its business plans, which conclude that in general BT's assumptions were overly optimistic.

A5.41 Ofcom's Adjusted NPV calculations include a number of more reasonable churn rate forecasts as set out in Annex 6.

Period of NPV calculations

A5.42 Ofcom considers that the correct approach to investigating allegations of anti-competitive exclusionary behaviour such as the conducting of a margin squeeze is generally to use the equally efficient operator ("EEO") test. The key question in applying this test in this case is whether an EEO would regard BT's business plan as one that generated sufficient returns, over an acceptable period, to make the investment worthwhile given the risk of the investment. If an EEO would not be willing to invest because the payback was too far into the future, this would suggest that the payback period was too long and was therefore not reasonable to use in a margin squeeze test.

A5.43 Since it regards the EEO test as the basis for an assessment of margin squeeze, Ofcom considers that it is unreasonable to extend an NPV analysis beyond timescales that would appear reasonable to an EEO. On this basis it applied in the Director's Decision a fixed period of five years from the launch date of the business.

A5.44 BT's business plans frequently assessed future profitability for relatively long periods, ranging between $[\text{X}]$ and $[\text{X}]$ years from the launch date of the relevant service. $[\text{X}]$. This is consistent with the marked variation apparent between BT's business plans as to the period selected for the NPV analysis.

A5.45 In the December 2003 Plan, the Regulatory NPV for BT Openworld was stated to be £$[\text{X}]$ million, calculated over a period of $[\text{X}]$ years from 1 April 2002 to 31 March $[\text{X}]$. The "Regulatory" section of the relevant pricing paper comments that "[$[\text{X}]$]". The paper also comments that "[$[\text{X}]$]".

A5.46 The December 2003 Plan included a Regulatory NPV for BT Broadband of £$[\text{X}]$ million calculated over a period of $[\text{X}]$ years from 2002/3 to $[\text{X}]$. The Plan states that the discounted payback period (i.e. the period required to produce a positive NPV) is $[\text{X}]$ years from 2002/3.

A5.47 The September 2004 Plan for BT was submitted for BT's Broadband Portfolio. The plan stated that the regulatory discounted payback period (i.e. the period after which the discounted cashflows became positive) was $[\text{X}]$ years. No regulatory NPVs were presented in the pricing paper although the supporting spreadsheet calculated a positive NPV of £$[\text{X}]$ million over $[\text{X}]$ years from 2002/3.

A5.48 There are a number of relevant considerations when determining the time period over which to conduct an NPV analysis, depending on the purpose of the analysis and the nature of the service and market involved.

A5.49 Some measures of profitability assess profitability over long periods. This is typically done by preparing a set of cashflow forecasts over an extended period (say 10 years) and then assuming a perpetuity value of the business at the end of the forecast period to estimate future profits (usually on the basis of a constant level of...
profits or building some rate of growth of profit into perpetuity). Such an approach is often used in valuing businesses when they are bought and sold.

A5.50 However, for the reasons set out in the Director’s Decision, Ofcom considers that it is in general not appropriate in the context of a margin squeeze case to extend an NPV analysis over very long periods. The longer the period considered, the greater the risks of creating a business plan that would not represent a credible investment for an EEO. Specific problems include the risks of:

- including profitability from future periods not causally related to the conduct in the period investigated;
- forecast error; and
- building in the rewards of anti-competitive behaviour.

A5.51 In Ofcom’s view taking into account profits over too long a period risks including profits that are not causally related to the period of the investigation and would not be regarded by an EEO as arising from the same investment strategy. The presence of this risk weighs in favour of dealing with the future value arising from those activities by limiting the forecast to some reasonable period of time (for example, based on the life of key investments) and by including a terminal value reflecting the future economic value of assets in situ at the end of the forecast period.

A5.52 An analysis over the very long run also carries with it the risk of incorporating expectations of supra-normal profits arising in the future as a consequence of current anti-competitive conduct. For example the margin squeeze today may squeeze out competitors to the extent that the undertaking may be able to sustain high margins in future when competition is significantly weaker. Whilst adjustments to the NPV analysis can be made to attempt to take account of this possibility, seeking to make such adjustments over the very long run can pose difficulties in practice by compounding the risk of forecasting error. For example, in very long run forecasting the result is increasingly dependent on reasonable assumptions as to the dominant firm’s downstream market share and rate of change in competitive conditions. Ensuring such predictions avoid including rewards for a future lack of competition becomes increasingly difficult the longer the forecast period.

A5.53 Finally, Ofcom considers that forecasting error is a practical obstacle to using a very long run approach in margin squeeze assessments. While all forecasting methods carry risk of error, a longer time horizon increases that risk, given the needs of a margin squeeze analysis to assess behaviour in a specific period of time, significantly shorter than the full period of the NPV analysis. In well-established services, the requirement to forecast over the very long run can be demanding; in the current context with a market that exhibits some characteristics of an immature market for at least some of the period under investigation, this concern is accentuated. Ofcom also notes that BT’s historic performance has shown significant variances against business plans in relation to volumes, costs and revenues compared to the launch business plans, confirming that high levels of forecast error can be expected in a rapidly changing market such as that for consumer broadband services, even for market participants (see Annex 5).

A5.54 Concerns about this approach were set out in the Director’s Decision, which noted that:
“The Director rejects BT’s suggestion that the relevant period should extend beyond the lifetime of key investments. An approach that allows a business to make losses on its current key investments, with the expectation that they will be compensated by future supernormal profits on later investments, runs the risk of building in the rewards of anti-competitive behaviour, precisely what this analysis is intended to test for.”

A5.55 Given these concerns, one approach would be to limit the period of analysis by reference to the economic lifetime of the assets employed by the business in question. This would ensure that all expected economic benefits arising from the use of those assets were captured in the assessment of its profitability.

A5.56 In some businesses, involving a single large upfront investment in an asset (such as a factory), such an approach may be relatively straightforward: the period of the margin squeeze analysis may be tied to the life of the asset in question.

A5.57 In the present case, however, there is no such definitive period by reference to which the appropriate length of an NPV analysis in the context of a margin squeeze assessment may be determined. It is therefore appropriate to conduct a sensitivity analysis in such circumstances, taking into account results for a range of reasonable forecast periods.

A5.58 The main ‘asset’ acquired by BT’s downstream operations is its customer base. [X%] of the investment in BT’s downstream operations consists of the costs involved in acquiring customers (marketing, modem costs, and wholesale connections costs). The average customer lifetime varied between three and four years, based on the six-month moving averages of historical monthly churn rates for BT’s Broadband Portfolio in the period covered by the investigation, although the average life for BT Openworld customers exceeded five years.

A5.59 However, BT has been continually acquiring customers at different points in time and those customers’ lives will all end at different points in time. It is therefore not possible cleanly to determine the period of analysis by reference to the average customer lifetime.

A5.60 More importantly, the intention in the NPV analysis is to set the profitability of the customers acquired during the period of the investigation in a wider context, reflecting the point that causality is not restricted to profits being made from the initial customer base. Ofcom believes that, up to a point, it is legitimate to allow for future cost reductions and for losses on these customers to be offset by profits on customers acquired later, i.e. after December 2004. But judgement is required on the extent to which such ‘offset’ should be permitted, as the longer the period, the greater the risk that the analysis is distorted by the deficiencies of forward-looking profitability analysis.

A5.61 Therefore, Ofcom considers that a reasonable approach is to determine a maximum fixed period by reference to all of the factors set out above. This was the approach taken by Ofcom in the Director’s Decision, where the NPV period arrived at was five years in its base case (up to a possible six years). In Ofcom’s view, it would have been reasonable to expect BT to limit its NPV analysis by reference to that period.

A5.62 It is difficult to specify a cut-off point beyond which no weight should be placed on results. However, it would in Ofcom’s view in the circumstances of this case be appropriate to put progressively less weight on forecast periods extending beyond
six years from the start of the relevant period. In Ofcom’s view, periods in excess of six years from the start of the relevant period are likely to suffer increasingly from the weaknesses of forward-looking profitability in this context, as noted above. In considering the results of Ofcom’s adjustments to BT’s NPV analysis (the ‘Adjusted NPV Calculations’), Ofcom has therefore placed most reliance on NPV results for periods up to five years from the start of the relevant period, and considers forecasts of profits arising more than six years from the start of the period to become progressively less reliable.

A5.63 The relevant period in this decision has initially been taken to start on 1 June 2002 and Ofcom has therefore considered primarily forecasts extending five and six years from this point. However, as noted above, the period up to January 2004 is characterised by greater uncertainty both around the way that the market would develop and the precise nature of the margin squeeze test which Ofcom would apply. Ofcom has therefore separately considered NPVs based on forecasts starting in 2004. It has then in the light of the results of these two tests carried out an analysis of the sensitivity of the results for the period starting in June 2002 to changes in assumptions including the choice of forecast period.  

Increasing service margins

BT’s assumptions for future service margins unrealistic in a competitive market

A5.64 BT’s NPV calculations in its December 2003 and September 2004 Plans rely on assumptions that:

- BT’s unit costs would be lower in the period subsequent to that covered by the investigation;
- BT’s average revenues per customer would not decline (or would even increase); and hence
- that service margins – the difference between average revenues and recurring costs – would therefore be significantly higher in the future than in the period covered by the investigation; and would in some cases be ever-increasing.

A5.65 The effect of those assumptions is significant and contributes to BT’s forecasts of future profitability which in Ofcom’s view are unrealistic in a competitive market and therefore could mask the presence of losses that would be irrecoverable under competitive conditions.

A5.66 BT’s actual monthly service margins up to December 2003, together with the margins it assumed in the December 2003 Plan, are shown in Figure A5.2 below:

**Figure A5.2: BT’s December 2003 Plan service margin – actual and forecast**

Source: Ofcom analysis of BT’s management accounts and BT’s business plans

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241 Ofcom notes that all margin squeeze results are expressed in NPV January 2004 terms.
242 Charts A.xls spreadsheet.
A5.67 In Ofcom’s view Figure A5.2 appears to show that in its December 2003 Plan, BT assumed that it would achieve a very significant improvement in service margins and that these would then continue to rise indefinitely for the duration of the plan (from £[×£] per subscriber per month in 2003/4 to £[×£] in 2008/9).

A5.68 Figure A5.3 below shows BT’s forecast monthly service margins contained in its September 2004 Plan together with the actual service margins to that date.

**Figure A5.3: BT’s September 2004 Plan service margin – actual and forecast**

Source: Ofcom analysis of BT’s management accounts and BT’s business plans

A5.69 Figure A5.3 shows that in its September 2004 Plan, BT assumed that it would achieve an initial improvement in service margins in the following year, followed by ever increasing service margins throughout the rest of the plan period (from £[×£] per subscriber per month in 2004/5 to £[×£] in 2010/11).

A5.70 Figure A5.3 also shows that in 2004/5 the average service margin for BT’s Broadband Portfolio was £[×£] per subscriber per month compared to the £[×£] it had assumed in its December 2003 Plan for the same period. In Ofcom’s view, this very large variance from BT’s December 2003 Plan, particularly in such a short period, casts doubt on the reliability of BT’s subsequent forecast improvements in future levels of profitability.

A5.71 On the basis of BT’s forecast of ever-increasing service margins, BT assumed that the Return on Turnover it would earn in its September 2004 Plan was much higher than that in its December 2003 Plan (e.g. [×£]% in 2008/9 in the December 2003 Plan and [×£]% in the September 2004 Plan). Such a level of profitability appears high in a competitive market, relative to BT’s actual experience and the comparative evidence from other businesses.

A5.72 Ofcom considers that BT’s service margin forecasts are implausible, for the following reasons.

a) First, the high service margins assumed by BT appear to Ofcom to be inconsistent with the operation of a competitive market. Under conditions of competition, one would expect to see, over time, reductions in underlying costs being ‘competed away’, i.e. passed on to consumers in price reductions, rather than being retained by the ISP in the form of higher service margins. Similarly, under competitive conditions, future service margins can be expected to tend towards a level that provides for a reasonable return on investment for a given level of customer acquisition cost, churn rate and discount rate (a ‘cohort break-even service margin’). BT’s forecast service margins are materially higher than those implied by its own assumptions. Clearly, if a positive NPV result relied upon future profits at levels which were not sustainable in a competitive market, then this would be consistent with anti-competitive conduct in incurring downstream losses on the basis that it would subsequently be able to earn supra-normal returns later on.

b) Second, BT’s service margin forecasts are significantly more optimistic than the internal forecasts obtained by Ofcom from BT’s mass market competitors on the downstream market. This is despite the fact that BT’s actual service

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243 Charts A.xls spreadsheet.
margins at the end of 2004/05 were significantly lower than those of its mass market competitors.

A5.73 Ofcom has also considered the reasonableness of BT’s forecast service margins by comparing them with the actual and forecast customer acquisition costs and service margins of its competitors. Such a comparison is useful as it provides a basis for comparison for assessing the justifiability and plausibility of BT’s own business plan assumptions.

A5.74 Ofcom surveyed a range of ISPs in April 2005 and obtained data relating to current and forecast service margins and customer acquisition costs. Data were obtained from a number of mass market ISPs and other ISPs which may be characterised as ‘fringe’ or ‘specialist’. In Ofcom’s view, the results for these latter ISPs do not provide as useful a basis on which to assess the reasonableness of BT’s assumptions as do those for the mass market ISPs.

A5.75 BT’s expectations of future service margins differed from those of its mass market competitors as shown in Figure A5.4 below.

Figure A5.4: ISPs’ service margins

Source: Ofcom analysis of BT and competitors’ business plans

A5.76 Figure A5.4 shows that BT’s plans assume that its service margins will on average increase to more than £[>]< per subscriber per month in 2010, over [>]< the level expected by BT’s average mass market competitors.

A5.77 Ofcom considers that historic information on BT’s forecast cost reductions suggests that these cost reductions were not in fact achieved. Ofcom considers BT’s proposed unit cost reductions going forward may similarly overstate the extent of cost reductions and therefore the future service margins available.

A5.78 BT ought to have known, once the Director’s Decision had been issued, that it was unreasonable to rely on such service margin forecasts for the purpose of assessing whether or not it was engaging in a margin squeeze. The Director’s Decision, issued to BT prior to either the December 2003 or September 2004 business plans were approved, emphasised the need to limit forecast future service margins to those which could be considered consistent with a competitive outcome:

“…in allowing future anticipated cost reductions in a DCF analysis, it is important to avoid building in the rewards of anti-competitive behaviour.”

A5.79 Under competitive conditions it is reasonable to assume that competitive pressures would mean that the service margin would tend towards the level that provided ISPs with a reasonable return on current investments. In particular, for any given level of customer acquisition costs and churn rates, it would be reasonable to expect service margins to tend towards a break-even level, which corresponds to a ‘normal’ rate of profit. This does not rule out margins ever being materially above (or below) such a level at least for a transitory period, particularly in an evolving market. But one would not expect margins to be persistently and significantly higher than this break-even level under competitive conditions.
A5.80 A cohort analysis provides a useful tool to consider what level of service margin may be sustainable in the long run. The cohort analysis measures the profitability of a group of customers (the cohort) with a given customer acquisition cost, given churn rates and an assumed service margin for that group of customers over their lifetime. The profitability of the cohort is measured in an NPV calculation. It is also possible to determine on the basis of a given customer acquisition cost and churn rate what level of service margin would be required for the ISP to achieve break-even for the cohort, that is, to achieve a zero NPV (implying that the revenues obtained from the cohort just cover the costs associated with the cohort including a reasonable return on investment).

A5.81 A cohort analysis can provide a useful check on the consistency of business plan forecasts with conditions in a competitive market. In particular, a forecast service margin significantly in excess of that required for cohorts in the plan to break-even could indicate that the firm is forecasting overall service margins or prices that are in excess of those that would be consistent with a competitive market, particularly if customer acquisition costs and churn rates between competitors are similar.

A5.82 Figure A5.5 below shows the service margins forecast by BT in its December 2003 Plan and the break-even service margins implied by the acquisition costs and churn rates assumed by BT in that Plan.

Figure A5.5: BT’s December 2003 Plan – Actual, forecast and Plan cohort break-even service margins

Source: Ofcom analysis of BT’s business plans

Figure A5.6 below shows the service margins forecast by BT in its September 2004 Plan and the break-even service margins implied by the acquisition costs and churn rates assumed by BT in that Plan.

Figure A5.6: BT’s September 2004 Plan – Actual, forecast and Plan cohort break-even service margins

Source: Ofcom from BT’s business plans

A5.85 Figure A5.6 shows that the monthly service margins per subscriber assumed by BT in its September 2004 Plan for 2010/11 were £[£<] compared to a cohort break-even service margin of £[£<].

A5.86 In Ofcom’s view, the significant and persistent gaps between the service margins assumed by BT in its business plans and the corresponding cohort break-even service margins shown in Figure A5.5 and Figure A5.6 suggest that these are not realistic in a competitive market. The paragraphs below explain how, in constructing its adjusted NPV analysis, Ofcom has corrected for BT’s unrealistic service margin forecasts.

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244 Charts A.xls spreadsheet.
245 Charts A.xls.
Correcting for BT’s unreasonable service margin forecasts

A5.87 Ofcom’s cost adjustments to BT’s business plans have the effect of reducing the forecast service margins. However, even after Ofcom’s adjustments, the margins are still forecast by BT to increase significantly from their actual levels and there remains a serious risk that the forecast margins are inconsistent with a future competitive market.

A5.88 Ofcom has applied a contestability analysis in order to render BT’s NPV calculations more compatible with future conditions of competition on the downstream market.

A5.89 A contestable market is one in which the absence of sunk costs means that the threat of entry prevents the incumbent from raising prices to a level above that consistent with earning ‘normal’ profits. It is thus a reasonable benchmark for the prices which would prevail under competitive conditions. In the contestability scenarios, the threat of entry is assumed to limit the extent to which the service margin is allowed to grow over the later years of BT’s business plans. The purpose of the contestability scenarios is to assess the reasonableness or robustness of the positive NPVs in BT’s business plans and explore whether BT might be able to recover losses incurred during the period of the investigation from future profits under competitive conditions.

A5.90 The contestability analysis applied by Ofcom involves limiting any forecast growth in service margins over the later years of the NPV calculation. Ofcom has recalculated NPVs on the basis that any forecast increase in service margins will only continue until a certain specified date, and that service margins will thereafter remain static. Ofcom has applied various ‘contestability scenarios’ to BT’s adjusted calculations, which vary in the date after which it is assumed that growth in service margins will cease. Contestability scenarios provide a pragmatic method to address a complex issue, namely the level of service margins in a future competitive market. They enable an assessment of the effect of different increases in forecast service margin.

A5.91 In considering the level of service margins which would be consistent with a competitive outcome, Ofcom considers that a useful benchmark is that level which would provide ISPs with a reasonable return on investment (in customer acquisition costs, development costs and fixed assets) given expected churn rates and discount rates. Such a service margin is provided by a cohort break-even service margin.

A5.92 As explained above, Ofcom considers it reasonable to apply contestability constraints on service margins in the year in which the planned service margin first materially exceeds the cohort break-even service margin. Restricting service margins in this way still provides for significant improvement in the service margins actually being earned by BT up to the date of the plan.

Results of Ofcom’s NPV calculations

Interpretation of contestability analysis

A5.93 As noted above, the contestability assumption in principle reflects the necessity for the service margins not to reflect an increase in market power arising from the behaviour being investigated. While the contestability assumption is intended to address this issue, it is not the intention that the test should take place against a background of a perfectly competitive or perfectly contestable market. The logic of
the test is that the background to it should be the conditions in a real undistorted market. These might be some way from those prevailing under models of perfect competition or perfect contestability. Accordingly, it is prudent, in the context of the need for any infringement finding to be robust, to place rather less weight on the toughest contestability scenarios as these may reflect more competitive conditions than would prevail in a real undistorted market.

A5.94 Following Ofcom’s adjustments, the NPV calculations contained in BT’s December 2003 and September 2004 plans both produce modest positive results when considered over a five year period from the start of the plan under all but the harshest of contestability scenarios, which for the reasons above should be accorded less weight in the overall assessment than the more central contestability scenarios.

A5.95 The following table sets out the results of the adjusted NPV calculation in the December 2003 plan when extended over a five year period under various contestability scenarios applying from 2006/07. As explained in this Annex, Ofcom considers that it is reasonable in the circumstances of this case to rely on NPV calculations extending over such a period. Further, as explained in Annex 6, Ofcom considers that it is reasonable not to apply contestability until at least 2006/07.

A5.96 The below tables show for a range of NPV periods and contestability scenarios the NPV results that the analysis produces; It is worth noting that the NPV period for the December 2003 plan ranges from three year to five years whilst the NPV period for the December 2004 plan (because it is a later plan) ranges from five to seven years.

Table A5.7: NPV results over a range of NPV periods and the contestability scenarios - December 2003 business plan

<table>
<thead>
<tr>
<th>£m</th>
<th>Period for NPV calculation (years)</th>
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<tr>
<td></td>
<td>06/07</td>
</tr>
<tr>
<td>Financial period</td>
<td></td>
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<tr>
<td>NPV period (from NPV start date)</td>
<td>3</td>
</tr>
<tr>
<td>Period of NPV analysis before contestability is applied to service margins</td>
<td></td>
</tr>
<tr>
<td>2 years (06/07)</td>
<td>-[×]</td>
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<tr>
<td>3 years (07/08)</td>
<td>-[×]</td>
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<tr>
<td>4 years (08/09)</td>
<td>-[×]</td>
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Table A5.8: NPV results over a range of NPV periods and the contestability scenarios - September 2004 business plan

<table>
<thead>
<tr>
<th>£m</th>
<th>Period for NPV calculation (years)</th>
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<tr>
<td></td>
<td>08/09</td>
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<tr>
<td>Financial period</td>
<td></td>
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<tr>
<td>NPV period (from NPV start date)</td>
<td>5</td>
</tr>
<tr>
<td>Period of NPV analysis before contestability is applied to service margins</td>
<td></td>
</tr>
<tr>
<td>2 years (06/07)</td>
<td>![&gt;]&lt;</td>
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<tr>
<td>3 years (07/08)</td>
<td>![&gt;]&lt;</td>
</tr>
<tr>
<td>4 years (08/09)</td>
<td>![&gt;]&lt;</td>
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A5.97 When Ofcom considers the NPV tests that form part of the objective justification for the period June 2002 to December 2003 sensitivities for the churn rates used in the analysis, and the value placed on a subscriber at the end of the period are considered. To increase the understanding of the calculations and the way in which assumptions within the NPV analysis affect the results similar sensitivity analysis are carried out on the main NPV test as described in Section 4 of the decision with regard to the churn rate assumption.

A5.98 The tables below show the results of the NPV test used to assess BT’s conduct in the period January 2004 to December 2004 when the assumption regarding churn rates in the models are varied. For the December 2003 plan, Ofcom’s ‘optimistic’ churn assumptions are used and for the September 2004 plan, BT’s own (reasonable) forecast is used (for a discussion of these see Annex 6).

Table A5.9: December 2003 business plan with Ofcom Optimistic churn rates assumed

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<thead>
<tr>
<th>£m</th>
<th>Period for NPV calculation (years)</th>
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<tr>
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<td>06/07</td>
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<tr>
<td>Financial period</td>
<td></td>
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<tr>
<td>NPV period (from NPV start date)</td>
<td>3</td>
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<tr>
<td>Period of NPV analysis before contestability is applied to service margins</td>
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</tr>
<tr>
<td>2 years (06/07)</td>
<td>![&gt;]&lt;</td>
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<tr>
<td>3 years (07/08)</td>
<td>![&gt;]&lt;</td>
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<tr>
<td>4 years (08/09)</td>
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Table A5.10: September 2004 business plan with BT’s assumed churn rates included

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<thead>
<tr>
<th></th>
<th>£m</th>
<th>Period for NPV calculation</th>
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<tr>
<td></td>
<td></td>
<td>(years)</td>
</tr>
<tr>
<td>Financial period</td>
<td>£m</td>
<td>08/09 09/10 10/11</td>
</tr>
<tr>
<td>NPV period (from NPV start date)</td>
<td></td>
<td>5 6 7</td>
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<tr>
<td>Period of NPV analysis before contestability is applied to service margins</td>
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<td>[&gt;] [&gt;] [&gt;]</td>
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<tr>
<td>2 years (06/07)</td>
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<tr>
<td>3 years (07/08)</td>
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<td>4 years (08/09)</td>
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<td>[&gt;] [&gt;] [&gt;]</td>
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Cohort analysis

A5.99 Ofcom considers that a cohort analysis, which measures the profitability of a group, or cohort, of customers acquired in the same period, can be a useful tool for assessing the level of service margin which might be sustainable in a competitive market in the long run. It can also be used as an aid to interpreting the results of the NPV analysis of the whole business.

A5.100 With this aim, Ofcom has undertaken an analysis of different groups of customers. In particular, Ofcom has calculated the profitability, using an NPV calculation, of three customer cohorts:

- customers acquired before 2004/5 – the ‘opening cohort’;
- customers acquired in 2004 – the ‘2004 cohort’; and
- customers acquired in subsequent periods.

A5.101 The results of the cohort analyses are set out in Annex 8. The cohort analyses indicate that the opening cohort of subscribers is unprofitable, the customers acquired in 2004 broadly break-even, and subscribers acquired after 2004/5 are increasingly profitable.

A5.102 Ofcom considers that the cohort analysis is consistent with the results of the overall NPV analysis of BT’s business plans, set out above. Specifically, profitability for customers acquired in 2004 appears to be broadly break-even, with subscribers acquired after this time becoming increasingly profitable.

A5.103 Consideration of this more granular analysis sheds light on what lies behind the NPV results for the business plan as a whole. In particular, it shows that an overall positive NPV rests on it being reasonable for losses on BT’s customers during the period investigated, i.e. the opening and 2004 cohorts, to be offset by profits on customers acquired subsequently. We have taken the view that such ‘offset’ is reasonable to a degree (although it should be limited by avoiding extending the NPV analysis too far into the future).
Conclusion on Ofcom’s NPV calculations

A5.104  Ofcom’s NPV analyses show that, following Ofcom’s adjustments to BT’s NPV calculations, BT’s downstream operations could, from 1 January 2004 onwards, have been expected to make profits in a number of plausible and reasonable scenarios. Under other scenarios, losses are observed but these are small relative to revenues so that only relatively small variations in revenues and/or costs would result in breakeven for the businesses in question.

A5.105  In the circumstances of this case, Ofcom does not consider that the results of its NPV analysis support a finding of margin squeeze for the period from January 2004 onward.
Churn rates

Introduction

A6.1 Churn rates are an important factor in the financial performance of an ISP. They determine:

- the volume of subscribers generating revenues;
- the rate of amortisation of connection costs in relation to subscriber acquisition costs; and
- the closing volume of subscribers and hence the terminal value.

A6.2 Ofcom has reviewed forecast churn data from BT’s business plans in order to assess whether they were reasonable and appropriate for use in an NPV assessment of profitability in a competition analysis.

BT’s December 2003 Plan

A6.3 Figure A6.1 below shows the actual monthly churn rates for BT Openworld and BT Broadband up to December 2003 and the rates forecast by BT in its December 2003 Plan.

Figure A6.1: BT’s churn rates December 2003 Plan

Source: Ofcom's analysis of BT's business plans

A6.4 The pattern in Figure A6.1 is consistent for both BT Openworld and BT Broadband; in each case BT’s historic churn rates are expected to decline significantly and unreasonably below observed actual churn rates. Furthermore, in the case of BT Openworld, BT’s forecasts are significantly lower than those set out by Ofcom in the Director’s Decision.

A6.5 Ofcom considers the forecast churn rates in BT’s December 2003 business plan to be unrealistically low. The implication of BT’s assumption is that customers would remain with BT for very long periods, up to [X] years on average.

A6.6 Figure A6.2 below shows the average subscriber lives implied by the actual churn rates and those assumed in BT’s December 2003 Plan.

Figure A6.2: BT’s unrealistic average subscriber lives - December 2003 Plan

Source: Ofcom analysis of BT’s business plans

A6.7 In Ofcom’s view, the average subscriber lives forecast by BT in its December 2003 Plan and as shown in Figure A6.2 were unreasonably aggressive. The historic evidence available to BT at the time it made its forecasts did not support the assumption that future lives would increase to the levels forecast.
**BT's September 2004 Plan**

A6.8 Figure A6.3 below shows the actual monthly churn rates for BT Openworld and BT Broadband up to September 2004 and the rates forecast by BT in its September 2004 Plan.

**Figure A6.3: BT's churn rates September 2004 Plan**

[\(\%\)]

*Source: Ofcom's analysis of BT's business plans*

A6.9 In Ofcom's view, BT's churn assumptions in its September 2004 Plan shown in Figure A6.3 continue to be highly optimistic, particularly for BT Broadband, where churn is assumed to fall by half despite BT having experienced a period of consistently higher churn. However, these forecasts are not as unrealistic as those contained in the December 2003 Plan.

A6.10 Figure A6.4 below shows the average subscriber lives implied by the churn rates assumed in BT's September 2004 Plan.

**Figure A6.4: BT's unrealistic average subscriber lives - September 2004 Plan**

[\(\%\)]

*Source: Ofcom analysis of BT's business plans*

A6.11 In Ofcom's view there was a significant risk that BT's churn assumptions in its September 2004 Plan and the average subscriber lives they imply would not be achieved and they should be viewed as insufficiently robust for the purpose of forecasting future profits in the context of a margin squeeze analysis.

A6.12 Ofcom considers that after the publication of the Director's Decision in November 2003, BT ought reasonably to have known that the incorporation in its NPV calculations in its December 2003 and September 2004 plans of implausibly low churn rates and implausibly high customer lives would produce forecasts upon which it would be unreasonable to rely for the purposes of assessing whether it was engaging in a margin squeeze.

A6.13 The Director's Decision criticised the annual churn rate of \(\%\) (\% per month) forecast by BT in its launch case for BT Openworld on the basis that it was implausibly low.\(^{246}\) In that Decision, Oftel replaced BT's unrealistic forecast with a more reasonable range of rates based on those experienced by BT for its narrowband consumer internet services. The annual churn rates used by Oftel based on evidence available to BT at the time it prepared its launch plan ranged from \(\%\) to \(\%\) (\% and \% per month respectively).\(^{247}\) Subsequent actual data indicates that the lower end of this range was overly optimistic.

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\(^{246}\) Director's Decision, paragraph 6.22.

\(^{247}\) Director's Decision, paragraph 6.24.
Removing BT’s inappropriate churn rate assumptions

A6.14 In Ofcom’s view BT’s forecasts were overly optimistic and Ofcom has therefore prepared NPV calculations based on a number of more reasonable assumptions.

A6.15 Ofcom has considered three alternative bases for churn assumptions for BT’s December 2003 Plan and BT’s September 2004 Plan.

A6.16 First, Ofcom has prepared a churn rate scenario which represents what Ofcom considers to be a reasonable view of future churn rates based on available data and trends and allowing for a reasonable improvement over time (the ‘Ofcom Reasonable churn rate scenario’).

A6.17 Second, Ofcom has estimated a churn rate scenario which assumes significant improvements from actual rates (the ‘Ofcom Optimistic churn rate scenario’). For BT’s September 2004 Plan, Ofcom considers that BT’s own assumptions can be regarded as ‘optimistic’ and therefore Ofcom has not prepared a separate set of churn rate assumptions for this scenario.

A6.18 Third, Ofcom has calculated a churn rate scenario which assumes that future churn rates are forecast on a weighted average of all available historic data. The application of this assumption assumes that there will be no improvement in future churn rates (the ‘Ofcom Historic churn rate scenario’).

A6.19 Details of Ofcom’s churn rate scenarios for BT’s December 2003 Plan and BT’s September 2004 Plan are set out in Table A6.5 and Table A6.6 below alongside the actual churn rates prior to the forecast period and are also depicted graphically in Table A6.1 and Table A6.3 above.

Table A6.5: Ofcom’s Churn Rate Scenarios – BT’s December 2003 Plan

<table>
<thead>
<tr>
<th></th>
<th>BT’s forecast churn rates</th>
<th>Ofcom Reasonable churn rate scenario</th>
<th>Ofcom Optimistic churn rate scenario</th>
<th>Ofcom Historic churn rate scenario</th>
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<tbody>
<tr>
<td>BT Openworld</td>
<td>[&lt;&gt;]-[&lt;&gt;]%</td>
<td>[&lt;&gt;]%</td>
<td>[&lt;&gt;]%</td>
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<tr>
<td>BT Broadband</td>
<td>[&lt;&gt;]-[&lt;&gt;]%</td>
<td>[&lt;&gt;]%</td>
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<td>[&lt;&gt;]%</td>
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</table>

Source: Ofcom analysis of BT’s business plans

Table A6.6: Ofcom’s Churn Rate Scenarios – BT’s September 2004 Plan

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<tr>
<td>BT Openworld</td>
<td>[&lt;&gt;]-[&lt;&gt;]%</td>
<td>n/a</td>
<td>[&lt;&gt;]%</td>
<td>[&lt;&gt;]%</td>
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<tr>
<td>BT Broadband</td>
<td>[&lt;&gt;]-[&lt;&gt;]%</td>
<td>n/a</td>
<td>[&lt;&gt;]%</td>
<td>[&lt;&gt;]%</td>
</tr>
</tbody>
</table>

Source: Ofcom analysis of BT’s business plans
**BT’s submissions on churn rates**

A6.20 In response to the third SO, BT submitted further churn data and arguments relating to Ofcom’s adjustments to BT’s forecast churn rates. In summary:

- BT argued that Ofcom’s use of an historic average churn rate is flawed as it ignores the effect of a churn rate that varies with customer age;

- BT stated at the oral hearing on 23 February 2007 that,\(^{248}\) (a) Churn rate peaks at \([\times]-[\times]\) months from acquisition, and (b) thereafter the propensity to churn decreases;

- BT provided a limited amount of churn data to Ofcom. Ofcom has analysed the data presented by BT, which indicates:
  - Variable churn rates between months \([\times]-[\times]\) of customer tenure;
  - A peak in customer churn after approximately \([\times]\) months tenure, i.e. at the end of \([\times]\); and
  - Some evidence of a downward trend in months \([\times]-[\times]\) (i.e. to the end of the period of data provided by BT), although this varies from month to month and for the last month of data provided, the trend is upwards.

A6.21 Ofcom has concluded that while it was reasonable to conclude that the evidence suggests a peak in churn rates occurring after the end of the minimum contract period, there is mixed evidence as to the trend thereafter. On average, the evidence suggests churn rates do decline with customer age, but the effect is not consistent and the most recent evidence shows an increasing churn rate with customer age.

A6.22 Based on the data provided by BT, Ofcom has concluded that:

- There is a peak in churn rates around the \([\times]\) anniversary of a customer’s joining, reflecting \([\times]\);

- The trend line of average churn rates for customers of all ages may be distorted by the peak at \([\times]\) months; and

- The impact of this peak will be more significant when customer volumes are lower, i.e. at an early date and may distort the monthly average churn.

A6.23 On this basis, the Ofcom analysis uses the ‘Ofcom Reasonable’ churn rates in its Revised NPV calculations. This is unchanged from Ofcom’s approach in the third SO.

A6.24 However, in its cohort analysis Ofcom has used churn rate assumptions which include the \([\times]\) month ‘spike’. In particular, the churn rate assumptions incorporate:

- for the 2004 Cohort the peak after \([\times]\) months; and

- for the Grand Cohort a blended rate which takes into account a \([\times]\) month peak for each annual group of subscribers after 2004/05.

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\(^{248}\) Tony Byrne presentation 23 February 2007, slide 9.
BT’s churn rate submissions following the third SO

A6.25 BT’s most recent submissions were to provide evidence to Ofcom of the variation in churn rate with customer age in respect of the arguments raised in response to the third SO and at the oral hearing.

A6.26 BT has argued that Ofcom’s use of an historic average churn rate as the basis for assessing forecasts of future churn rates is flawed as it ignores the effect of a churn rate that varies with customer age. BT stated:

“The SOs make the implicit assumption that all subscribers are alike in their switching characteristics.”\(^{249}\)

“With appropriate analysis, it should in principle be possible to identify time-dependence in churn rates, although the capacity to do so in practice will depend upon the length of the relevant time period over which data are available.”\(^{250}\)

A6.27 On the basis of a simple numerical example, BT showed that the use of an average churn rate rather than a churn rate that takes into account the mix of subscriber lives in the subscriber base at any point in time, can lead to misleading estimates of future churn rate. In particular, BT argues that:

“It is therefore somewhat ironic that one of the principal criticisms that Ofcom appears to make about the BT business plans is that those plans are based on assumptions about churn rates that are significantly below observed levels, when, if a constant or ‘levelised’ churn rate is (for simplicity) to be adopted for planning purposes, it is appropriate to adopt a lower-than-observed rate”

A6.28 In effect BT is arguing that if, as it asserts, churn rates decline with age, it is reasonable to assume that average churn rates will decline over time, even without any change in the actual churn rates by age – but simply as a result of the age profile of the subscriber base changing. In particular as the business becomes more mature, the proportion of new subscribers with a higher propensity to churn will decrease thus lowering the average churn rate.

A6.29 BT argued in the oral hearing that in other utility markets, such as gas and electricity, it was widely recognised that subscriber churn declined with age.

A6.30 BT stated at the oral hearing on 23 February 2007 that:\(^{251}\)

- Churn rate peaks at \([x]\) and \([y]\) months from acquisition
- Thereafter propensity to churn decreases

A6.31 BT also presented a chart which it claimed illustrated that churn rates did decline with customer age, as shown in Table A6.7 below:

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\(^{249}\) Submission of Professor George Yarrow, on behalf of BT page 7.

\(^{250}\) Submission of Professor George Yarrow, on behalf of BT, footnote 6, page 8.

\(^{251}\) Tony Byrne presentation 23 February 2007, slide 9.
The following monthly data for was submitted for the period August 2005 to September 2006 by BT:

Table A6.8: BT data example

‘Num Churn’ – represents the sum of all net churners for the three months up to and including the current reporting month;

‘Num at Start’ - represents the sum of all Broadband customers as at the first day of each of the three months up to and including the current reporting month; and

‘Num at End’ - represents the sum of all Broadband customers as at the last day of each of the three months up to and including the current reporting month.

For example in September 2005, in Table A6.8 above, the ‘Num Churn’ represents the total number of churners in July, August and September 2005 broken down according to the age of the customer (in months) in the month they left. Similarly, ‘Num at Start’ and ‘Num at End’ represent totals for July, August and September 2005 i.e. in the three months July - September 2005, a total of [✓] subscribers who had been with BT three months left BT. BT calculated an annual churn rate for these subscribers using the formula:

\[
\text{Churn} = 1 - \left(1 - \left(\frac{\text{churners in 3 month period}}{\text{average number of subscribers in period}}\right)^{12}\right)
\]

Gross and Net Churn

The churn data provided by BT is stated on a net basis after an adjustment to gross churn data to provide for home movers. BT’s data analysis consultant, [✓], stated that:

“Where a churner returns to BT within 90 days of ceasing their broadband account, the account closure is not considered a churn, BT state that this may occur for home-movers or due to payment problems. BT (via [✓]) incorporate this assumption into their analysis for the three months to the reporting month (i.e. in September, for July, August and September) by applying ‘churn reduction rates’:

The explanations provided by BT do not clarify how the reduction rates are arrived at. [✓] state:

“the following reduction rates were recently applied (Month 1 being the current reporting month):

\[
\text{Month 1:} [✓] (14.1\% \text{ reduction})
\]
Month 2: \(\geq\) (7% reduction)

Month 3: \(\geq\) (3.3% reduction)

The ‘Num Churn’ volume reported would therefore be the sum of the following:

\[
\text{Total churners in Month 1 } \times \geq
\]

\[
\text{Total churners in Month 2 } \times \geq
\]

\[
\text{Total churners in Month 3 } \times \geq^{252}
\]

A6.37 It is not clear from BT’s submissions how the figures for the reduction rate are calculated.

Ofcom Issues with Churn data

A6.38 Ofcom have identified the following issues which limit the usefulness of the churn data provided by BT:

- The data is presented on a rolling three month basis making monthly interpretation or reconciliation back to monthly data difficult;
- the data is only for a limited period - August 2005 to September 2006 and so it is not possible to observe the churn rate for a specific cohort for longer than 13 months;
- the data provided is for periods outside the period of the investigation;
- the data is net of home movers\(^{253}\) and uses an estimate of the number of customers who are returning to BT to calculate a net rate;
- data represents net churn, where BT and Ofcom have both previously modelled gross churn; and
- it is unclear how the churn reduction rates have been calculated or applied to BT’s data.

Further Ofcom Analysis of data by cohort age

A6.39 Figure A6.9 below sets out the monthly churn data provided by BT:

**Figure A6.9: Monthly Churn for BT data August 2005 – September 2006**

\[
\]

**Source:** BT data

A6.40 Each line shows, for a particular month, an annual net churn rate for all subscribers leaving in the past three months.

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\(^{252}\) Response to Question 9(i).

\(^{253}\) BT response to Question 9 of Ofcom’s 19th section 26 request dated 12 April 2006 “…a proportion of ‘churners’ will actually return to BT within 90 days of ceasing their broadband account…the account closure is no considered a churn.”
A6.41 To illustrate the variation in monthly data, Figure A6.10 and Figure A6.11 below show separate monthly data for August 2005 and January, August and September 2006.

**Figure A6.10: BT monthly churn data August 2005 and January 2006**

[▷]

*Source: Analysis of BT’s response to Q2 of Ofcom’s letter dated 8 March 2007.*

**Figure A6.11: BT monthly churn data August 2006 and September 2006**

[▷]

*Source: Analysis of BT’s response to Q2 of Ofcom’s letter dated 8 March 2007.*

A6.42 The charts suggest the following general features:

- A peak in customer churn after approximately [▷] months tenure, i.e. at the end of [▷].
- The [▷] monthly peak in churn has tended to increase over the period. This has a number of potential implications:
  - An increasing number of customers are churning each month after a [▷] month tenure period;
  - The trend line may be distorted by the peak at [▷] months; and
  - The impact of this peak will be more significant when customer volumes are lower, i.e. at an early date and may distort the monthly average churn.
- The monthly trend lines suggest:
  - [▷];
  - [▷]; and
  - [▷].

**Removing the 12 month peak in churn**

A6.43 The chart below sets out average churn for the data period provided (August 2005 to September 2006) and the effect on the data trend of removing the [▷] month churn peak.

**Figure A6.12: Average Churn**

[▷]

*Source: Ofcom analysis of BT data*

A6.44 Removing the churn rate peak reduces the average trend churn rates by +/- 1%.
Conclusion on whether the evidence supports Professor Yarrow’s hypothesis

A6.45 On balance, it would be reasonable to conclude that the evidence suggests a peak in churn rates occurring at the end of the minimum contract periods – [><]. There is mixed evidence as to the trend thereafter – on average the evidence suggests churn rates do decline with customer age - but the effect is not consistent and the most recent evidence shows an increasing churn rate with customer age.

Relationship between monthly and annual churn rates

A6.46 BT’s business plans are typically annual (rather than monthly). There is a potential difficulty in applying annual churn rates (where the churn rate is expressed as a percentage of subscribers at the beginning of the period) to amortise customer acquisition costs. This is because an annual churn rate is likely to overstate the true churn rate where (as is the case here) the subscriber base is growing as it fails to take into account the number of joiners in a year, some of whom will leave in the year of joining.

A6.47 Ofcom has applied the following formula to derive an appropriate churn rate to amortise costs (expressed as a monthly rate) from annual churn volumes as contained in the annual plans:

Definitions

\[ C_i = \text{installed customer base start month } i \]
\[ A_i = \text{cumulative churned customers end month } i \]
\[ B_i = \text{cumulative new installations end month } i \]
\[ a = \text{constant monthly churn rate – percentage } C_i \]
\[ b = \text{constant monthly installation rate – percentage } C_i \]

Derivation

A6.48 Cumulative churned customers at the end of each period can be derived from the previous period, leading to an iterative formula:

\[ C_n = C_1 (1 - a + b)^{n-1} \]

A6.49 This formulation, by construction, assumes that new customers (represented by the installation rate ‘b’) cannot churn in their first month.

A6.50 Cumulative new installations can then be derived:

\[ B_n = b[C_1 + C_2 + \cdots + C_n] \]
= b \sum_{i=1}^{n} C_i
= b \sum_{i=1}^{n} C_i (1 - a + b)^{i-1}
= bC_1 \sum_{i=1}^{n} \alpha^{i-1} \quad \text{where} \quad \alpha = 1 - a + b

\text{let } S = \sum_{i=1}^{n} \alpha^{i-1} \quad \Rightarrow \quad S = \frac{1 - \alpha^n}{1 - \alpha} \quad \text{(a geometric sum)}

\Rightarrow \quad B_n = bC_1 \frac{1 - \alpha^n}{1 - \alpha}

\Rightarrow \quad B_n = \begin{cases} 
\frac{bC_1 - (1 - a + b)^n}{(a-b)} & \text{if} \quad a \neq b \\
\frac{nbC_1}{naC_1} & \text{if} \quad a = b
\end{cases} \quad (1)

A6.51 \quad \text{Similarly, by symmetry of the expressions,}

A_n = \begin{cases} 
\frac{aC_1 - (1 - a + b)^n}{(a-b)} & \text{if} \quad a \neq b \\
\frac{naC_1}{naC_1} & \text{if} \quad a = b
\end{cases} \quad (2)

A6.52 \quad \text{Equations (1) and (2) imply:}

\frac{B_n}{A_n} = \frac{b}{a} \quad \Rightarrow \quad b = \frac{B_n}{A_n} a \quad (3)

B_n - A_n = C_1[(1 - a + b)^n - 1] \quad (4)

\Rightarrow \quad (1 - a + b)^n = \frac{B_n - A_n}{C_1} + 1

b - a = \left(\frac{B_n - A_n}{C_1} + 1\right)^\frac{1}{n} - 1

A6.53 \quad \text{Substituting (3):}
\[ a = \left( \frac{B_n - A_n}{C_n} + 1 \right)^{\frac{1}{n}} - 1 \]

provided \( B_n \neq A_n \)
Annex 7

Terminal Value

A7.1 In Ofcom’s view, it is necessary to include in a DCF analysis of future cash flows over a finite period a terminal value to allow for the value of relevant assets remaining at the end of the period. Failure to do so may lead to an overstatement of BT’s costs, and a corresponding underestimation of relevant profits, primarily because the NPV calculation is truncated in the middle of the life of a significant asset – chiefly in this case the customer base.

A7.2 In previous SOs, Ofcom took the view that the relevant issue being addressed by the inclusion of terminal value was the allocation of costs as between the relevant time period under examination, i.e. the explicitly modelled period up to the point of truncation of the NPV analysis— and the subsequent period, i.e. beyond the truncation point. The issue therefore centred around the allocation of the cost of assets that were acquired during the period under examination but which have a useful economic life beyond the truncation point.

A7.3 In Ofcom’s Adjusted Accounts Analysis, terminal values were calculated as follows. For customer acquisition costs, terminal values were calculated by depreciating the customer acquisition costs incurred during the core modelled period (and those brought in as opening assets at an MEA value) on a reducing balance basis at a rate equivalent to the annualised churn rate. This approach meant that on average, BT would recover the customer acquisition costs for each customer over the expected life of that customer (ignoring the minimum contract period). As individual customers had variable lives (due to the constant hazard rate approach taken to churn), BT was in effect assumed to recover more from customers with longer than average lives and less from customers with shorter than average lives.

A7.4 In Ofcom’s Adjusted NPV Analysis, terminal values were also calculated using a depreciated historic cost approach. In principle, Ofcom recognised that an MEA approach to calculating terminal values was more appropriate but, given that there was little evidence of changing values towards the end of the business plans, no adjustment was made to the historic cost values.

A7.5 For systems and product development costs, the terminal value was calculated by allowing for cost recovery of development costs incurred on a flat annuity basis over three years, to derive an appropriate terminal value. No attempt was made to rebase product development costs at the terminal value point because it was not clear that there was any reduction over time in the costs of product development on a ‘per unit’ basis. Similarly, the costs of fixed assets acquired during the core modelled period were assumed to be recovered on a flat annuity basis over three years to derive an appropriate terminal value. In the Ofcom Adjusted NPV Analysis terminal values were calculated on a similar basis.

A7.6 In its response to the second SO, BT commented that:

“Ofcom’s own terminal value calculation is seriously flawed and inappropriate. Ofcom effectively values BT’s businesses as the sum of the undepreciated cost (or book value) of its assets. This ignores

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254 Second SO, from paragraph 6.52.
the wealth of commentary by accountants, financial experts, and economists that this approach does not provide a sound basis for valuing either individual assets, or a company.”

A7.7 BT argued that Ofcom should have applied a terminal value based on the actual value of comparable companies.\footnote{BT’s Second Response, paragraph 101.} In particular BT suggested that the most appropriate way to calculate the terminal value would be to apply a value per subscriber based on that derived from the price paid for acquisition of comparable companies.\footnote{BT’s Second Response, paragraph 103.} BT provided per subscriber valuations from companies in different markets and also from other ISPs, which, if applied to BT would, it claimed, indicate significantly higher terminal values than those calculated by Ofcom based on an amortised cost approach to calculating terminal values.

A7.8 In the light of BT’s comments, Ofcom has reconsidered its approach to terminal value calculation. Ofcom accepts that, in principle, markets can provide a relevant and useful source of comparable information about values in some contexts.

A7.9 However, as is widely recognised in the literature on valuation, market based multiples need to be used with care, and in particular it is important to take account of underlying differences between businesses in applying the multiples. This is true even in the merger context in which such valuations are often used.

A7.10 In Ofcom’s view the market based valuations calculated by BT would need to be significantly adjusted before they could reflect the value of the firm’s residential broadband ISP business. As a minimum, adjustments would be needed to remove assets not related to the comparator firm’s DSL residential broadband ISP business such as cash and LLU assets and to remove the value of the business attributable to revenues other than residential broadband services.

A7.11 Ofcom’s view is that the practical difficulties of making these adjustments mean that BT’s approach is insufficiently reliable as a basis for calculating a comparable valuation for BT’s consumer broadband business for it to be used as the primary method of calculating a terminal value for use in a margin squeeze analysis. We do not, however, completely reject the usefulness in principle of market valuations.

A7.12 In Ofcom’s view, the most practical and economically justifiable approach to calculating terminal value in this case, consistent with its approach to the opening value of assets at the start of the period of analysis, is to calculate the value of the assets in place at the terminal value date at their MEA cost.

A7.13 Asset values calculated on an MEA basis will reflect the economic value of the asset to the business at the relevant date as the MEA value measures the cost of ‘replicating’ assets at the terminal value date. In a competitive market, firms should value subscribers acquired from other businesses at an amount equivalent to the costs of recruiting them including the cost of advertising and relevant connection costs, and pricing decisions would be based on the current cost of acquiring subscribers. For these reasons, Ofcom considers that an appropriate valuation method for the terminal value of subscribers in situ at the end of the period is an MEA approach. Ofcom has therefore used an MEA approach to the valuation of subscribers for both the opening and terminal values of BT’s subscriber base.
A7.14 For the purposes of assessing the alleged margin squeeze from 1 January 2004 onwards, Ofcom considers that an appropriate MEA-based terminal value of subscribers may be derived from the forecast of acquisition costs contained in BT’s business plans. As BT does not make an explicit forecast of acquisition costs, Ofcom has derived an implied value based on the costs of marketing, BT wholesale connection and ADSL equipment projected in BT’s September 2004 business plan for 2005/6 onwards. The figure derived in this way is £[>] per subscriber.257

A7.15 This is however a conservative estimate since, apart from the items listed above which are clearly related to customer acquisitions, all other costs are treated entirely as ongoing costs. It may however also be reasonable to treat some other cost items as at least partly related to customer acquisition, and Ofcom has taken this into account in its assessment of the robustness of the evidence before it. For these purposes Ofcom considers that a terminal value of £[>] is within the bounds of reasonable assumptions, in that it is consistent with the level of acquisition costs in the period before 2004, BT’s forecasts of total costs and a reasonable interpretation of running costs.

A7.16 Ofcom has also attempted, as a cross check, to derive adjusted market values for comparator companies which as far as possible reflect differences between BT and the comparators.

A7.17 Differences adjusted for include:

- Amounts of debt and cash the comparator held.
- Business subscribers where companies serviced both retail and business customers.
- Dial-up narrow band customers where comparator companies valuations included these.
- LLU assets where comparators had been building up their own network infrastructure.

A7.18 The resulting adjusted valuations are much closer to those derived from the costs of subscriber acquisitions, than the value suggested by BT’s comparator valuations.

A7.19 Although the valuations of a broadband customer using the two different methods are closer when the market values are adjusted for unrelated items in the comparator company, valuations of broadband customers using market based values are higher than those relying on an MEA approach to valuation. Indeed the adjusted market values remain somewhat above even the higher MEA-based value used in conducting Ofcom’s sensitivity analysis.

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257 There is some very small variation from year to year but the figure is approximately £[>] in every year thereafter.
Annex 8

Ofcom’s cohort analysis

A8.1 In addition to its NPV analyses for the whole of BT’s consumer broadband business, Ofcom has considered the profitability of groups of subscribers, assessing the profitability of all subscribers acquired in a particular month over the lifetime of that group of subscribers.

A8.2 The cohorts analysed by Ofcom are as follows:

- Customers acquired before 2004/05 – “the opening cohort”;
- Customers acquired in 2004/05 – “the 2004 cohort”; and
- Customers acquired in 2004 and subsequent periods – “the grand cohort”.

Opening Cohort

A8.3 The Opening Cohort measures the NPV of customers in place as at 1 April 2004. It can be calculated by subtracting the Grand Cohort (which comprises of all subscribers acquired after 1 April 2002) from the MEA NPV test set out in the decision in Section 4.

A8.4 The NPV Opening Cohorts for the December 2003 and September 2004 business plans are set out in Table A8.1 and A8.2 below.

Table A8.1: December 2003 Business Plan – Opening Cohort NPV analysis

<table>
<thead>
<tr>
<th>£m</th>
<th>Period for NPV calculation (years)</th>
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<tbody>
<tr>
<td></td>
<td>06/07</td>
</tr>
<tr>
<td>Financial period</td>
<td></td>
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<tr>
<td>NPV period (from NPV start date)</td>
<td>3</td>
</tr>
<tr>
<td>Period of NPV analysis before contestability is applied to service margins</td>
<td></td>
</tr>
<tr>
<td>2 years (06/07)</td>
<td>-[&lt;]</td>
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<tr>
<td>3 years (07/08)</td>
<td>-[&lt;]</td>
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<tr>
<td>4 years (08/09)</td>
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</table>

Table A8.2: September 2004 Business Plan – Opening Cohort NPV analysis

<table>
<thead>
<tr>
<th>£m</th>
<th>Period for NPV calculation (years)</th>
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<tbody>
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<td>-[&lt;]</td>
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<tr>
<td>4 years (08/09)</td>
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</tbody>
</table>
A8.5 Table A8.1 and A8.2 above show that at the time of the December 2003 and September 2004 Business Plans, the existing subscribers, valued at the value at the MEA at the beginning of 2004/5, were NPV negative. This is primarily attributable to the higher cost of acquiring these subscribers compared to future subscribers which in turn determines the service margins applied under contestability.

The 2004 Cohort

A8.6 Table A8.3 shows the NPV for the 2004 Cohort based on BT’s assumptions for future service margins and subscriber acquisition costs as set out in the December 2003 Business Plan (as adjusted by Ofcom).

Table A8.3: December 2003 Business Plan 2004/5 Cohort NPV Analysis

<table>
<thead>
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<th>£m</th>
<th>Period for NPV calculation (years)</th>
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<tbody>
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<tr>
<td></td>
<td>4 years (08/09)</td>
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</table>

A8.7 Table A8.3 shows that the NPV for the 2004 cohort under the December 2003 business plan assumptions (as adjusted by Ofcom) was positive for all NPV calculation periods beyond three years and all contestability scenarios.

A8.8 Table A8.4 shows the NPV for the 2004 Cohort based on BT’s assumptions for future service margins and subscriber acquisition costs as set out in the September 2004 Business Plan (as adjusted by Ofcom).

Table A8.4: September 2004 Business Plan 2004/5 Cohort NPV Analysis

<table>
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<tr>
<td></td>
<td>4 years (08/09)</td>
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</table>

A8.9 Applying the assumptions in the September 2004 Business Plan (as adjusted by Ofcom), the 2004/5 cohort for an NPV calculation period of five years and if contestability is applied after five years.
The Grand Cohort

A8.10 BT has argued that in addition to the cashflows prior to 2004/5, all cashflows after 1 April 2004 relating to subscribers acquired prior to that date should be excluded from the NPV analysis. In order to consider the impact of such an approach, Ofcom has calculated a ‘Grand Cohort’ NPV to assess profitability excluding the impact of subscribers acquired prior to 1 April 2004/5, but including all cashflows relating to subscribers acquired in 2004/5 and subsequent periods. Table A8.5 shows the Grand Cohort NPV for the December 2003 Plan (as adjusted by Ofcom).

Table A8.5: December 2003 Business Plan – Grand Cohort NPV analysis

<table>
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<td></td>
</tr>
<tr>
<td>2 years (06/07)</td>
<td>❌</td>
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<tr>
<td>3 years (07/08)</td>
<td>❌</td>
</tr>
<tr>
<td>4 years (08/09)</td>
<td>❌</td>
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</tbody>
</table>

A8.11 The Grand Cohort NPV for the December 2003 Plan (as adjusted by Ofcom) is positive for all contestability scenarios and NPV calculation periods.

A8.12 The Grand Cohort NPV calculations can usefully be compared to the Ofcom reasonable Churn rate whole business NPV calculations as these are based on broadly comparable churn rate assumptions.

A8.13 For the December 2003 Plan the Grand Cohort NPV is more positive than the ‘MEA’ calculation primarily because it excludes the negative NPV associated with the Opening Cohort.

Table A8.6 shows the Grand Cohort NPV for the December 2003 Plan (as adjusted by Ofcom).

A8.14 Table A8.6 shows the Grand Cohort NPV for the December 2003 Plan (as adjusted by Ofcom).

Table A8.6: September 2004 Business Plan – Grand Cohort NPV analysis

<table>
<thead>
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<tr>
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</tbody>
</table>

A8.15 The Grand Cohort NPV for the September 2004 Plan assumptions (as adjusted by Ofcom) is positive for NPV calculation periods longer than five years, for all contestability scenarios.
A8.16 As for the December 2003 Plan, the Grand Cohort NPV for the September 2004 Plan is more positive than the ‘MEA’ calculation primarily because it excludes the negative NPV associated with the Opening Cohort valued at the relatively high MEA cost of the opening subscribers as at 2004 (i.e. £[£] per subscriber).
Annex 9

Sensitivity analysis for the period June 2002 to December 2003

The period before June 2002

A9.1 Ofcom considers that it is not appropriate to take the analysis back in time before June 2002, and that any historic losses incurred before June 2002 should be excluded. This is for two reasons.

A9.2 First, in relation to the period prior to June 2002, the finding in the Director’s Decision was that BT had not been engaging in anti-competitive conduct in respect of its BT Openworld ‘plug and go’ broadband service in the period up to that date.

A9.3 Second, Ofcom notes that, prior to April 2002, BT offered a different broadband service compared with the broadband services available from April 2002 onward. A characteristic of that earlier service was that it required an engineer to install the broadband service, unlike the ‘plug and go’ service available from February 2002, which was BT’s first product offering designed for the mass market which could be set up by the subscriber without an engineer. Ofcom does not regard any losses arising from the earlier product sales as relevant to Ofcom’s test. Specifically Ofcom’s test would not require an EEO to recover past costs using an engineer based installation business model.

A9.4 In its analysis of BT’s conduct prior to 1 January 2004, Ofcom has considered the costs BT incurred prior to the start of its analysis in April 2002.

A9.5 In Ofcom’s view, for BT Openworld Broadband, it is necessary to include in the NPV calculation of profits the costs associated with the opening assets and subscriber base of customers and other assets in order to obtain an undistorted assessment of the profitability of the business. These relate to costs incurred prior to the launch date of BT Openworld Home 500 Plug & Go, such as acquiring customers. These previously acquired subscribers continue to pay a monthly subscription to BT Openworld and yield significant ongoing economic benefit to BT after April 2002.

A9.6 The rationale for this adjustment is set out in the Director’s Decision at paragraphs 5.86 to 5.111 and the practical application is set out in paragraphs 6.36 to 6.47:

“past cash flows which create an ongoing benefit for the business reflected in the Business Model (e.g. such as the costs of acquiring a set of subscribers) should be included in the Business Model and form part of a DCF analysis.”

A9.7 If only the ongoing revenue from these subscribers were included in the NPV analysis, but the costs of acquiring them were excluded, then it is possible that an incorrect conclusion could be drawn regarding the profitability of the business. This is because the revenues from the past subscribers could mask the losses from

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258 The reason for including such an ‘opening value’ is analogous to the rationale for including a terminal value at the point of truncation at the end of the NPV analysis.

259 Paragraph 5.111 of the Director’s Decision.
newly acquired customers, which the company would have been better off not acquiring.

A9.8 Further, if such past costs were excluded, then the NPV analysis would not address the fundamental economic issue of whether BT's prices were sustainable for an equally efficient competitor who would have to incur significant subscriber acquisition costs in order to generate the monthly subscription revenues.

A9.9 In paragraphs 5.86 to 5.111 of the Director’s Decision, Ofcom calculated the brought forward costs of the subscriber base, fixed assets and development costs to be £[>£] million. These costs are stated at the MEA basis reflecting their economic value to the business at the launch date. This calculation is also relevant to this investigation and, as it addresses an historical question, no amendment to the calculation is required.

A9.10 Thus, Ofcom believes that, in order properly to address the issue of BT's behaviour, it is necessary to perform a calculation consistent with the principle that pre-June 2002 losses should be excluded, but all activities post that date should be included. In order to achieve this objective, Ofcom has included in the starting value of the June 2002 based calculation the MEA value of BT's entire subscriber base (including those subscribers who bought a BT broadband service requiring engineer installation) as at April 2002.

Approach to the NPV analysis from June 2002

A9.11 Ofcom believes that the test for margin squeeze should be that set out in Section 4 and discussed in more detail in Annexes 3 and 5. In that test, Ofcom applies its preferred NPV methodology to cash flow forecasts starting in January 2004. Ofcom considers that an appropriate starting point in any assessment of the reasonableness of BT’s conduct prior to January 2004 is to apply this test to the period from June 2002 to assess whether or not losses incurred in that period could have been recovered by BT on the basis of reasonable assumptions, consistent with those used in the test for the period after January 2004.

A9.12 The results of Ofcom’s analysis are set out in the tables below for both the December 2003 (Figure A9.1) and September 2004 (Figure A9.2) plans for a range of NPV calculation periods and contestability scenarios.

Figure A9.1: Results of NPV analysis from June 2002 (December 2003 plan)

<table>
<thead>
<tr>
<th>Period for NPV calculation (years)</th>
<th>06/07</th>
<th>07/08</th>
<th>08/09</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financial period</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NPV period (from NPV start date ; now 2002)</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>Period of NPV analysis before contestability is applied to service margins</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 years (06/07)</td>
<td>-[&gt;£]</td>
<td>-[&gt;£]</td>
<td>-[&gt;£]</td>
</tr>
<tr>
<td>3 years (07/08)</td>
<td>-[&gt;£]</td>
<td>-[&gt;£]</td>
<td>-[&gt;£]</td>
</tr>
<tr>
<td>4 years (08/09)</td>
<td></td>
<td></td>
<td>-[&gt;£]</td>
</tr>
</tbody>
</table>

260 Comprising customer acquisition costs of £[>£] million, product development costs of £[>£] million and capital expenditure of £[>£] million.
Figure A9.2: Results of NPV analysis from June 2002 (September 2004 plan)

<table>
<thead>
<tr>
<th>£m</th>
<th>Period for NPV calculation (years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financial period</td>
<td>06/07</td>
</tr>
<tr>
<td>NPV period (from NPV start date; now 2002)</td>
<td>5</td>
</tr>
<tr>
<td>Period of NPV analysis before contestability is applied to service margins</td>
<td></td>
</tr>
<tr>
<td>2 years (06/07)</td>
<td>[&gt;&lt;]</td>
</tr>
<tr>
<td>3 years (07/08)</td>
<td>[&gt;&lt;]</td>
</tr>
<tr>
<td>4 years (08/09)</td>
<td>[&gt;&lt;]</td>
</tr>
</tbody>
</table>

A9.13 As set out at paragraph 4.126, Ofcom has therefore assessed the robustness of these results to changes in the assumptions in the test by conducting a sensitivity analysis.

Review of the NPV results including the Period Prior to 2004

A9.14 The starting point for the sensitivity analysis is the results shown above in Figures A9.1 and Figure A9.2.

Figure A9.3: Impact of including pre-2004 losses

<table>
<thead>
<tr>
<th></th>
<th>Margin squeeze test: NPV result for 1 January 2004 onwards</th>
<th>NPV result for 1 January 2004 onwards including pre-2004 losses</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>December 2003 plan</td>
<td>£[&gt;&lt;]m</td>
<td>-£[&gt;&lt;]m</td>
<td>£[&gt;&lt;]m</td>
</tr>
<tr>
<td>September 2004 plan</td>
<td>£[&gt;&lt;]m</td>
<td>-£[&gt;&lt;]m</td>
<td>£[&gt;&lt;]m</td>
</tr>
</tbody>
</table>

A9.15 Ofcom has considered the effect of alternative assumptions to those used in its test in respect of two key variables, churn and terminal value. In addition Ofcom has considered the effect of different payback periods and contestability scenarios.

Churn rates

A9.16 Ofcom’s test relies on Ofcom’s view of a reasonable churn assumption (referred to as ‘Ofcom’s reasonable churn rate’). However, Ofcom recognises that, at the time BT was formulating its business plans, there would have been considerable uncertainty around this variable.

A9.17 Ofcom considers that a reasonable sensitivity to apply is to use churn forecasts closer to those made by BT that could have been viewed to fall within the range of plausible forecasts at that time.

A9.18 In respect of BT’s early business plans, and in particular at the beginning of 2002, Ofcom notes BT assumed a forecast churn at rates as low as [><]% per month. In
subsequent plans this forecast was revised upward as higher subscriber numbers and higher outturn churn rates were realised. In the December 2003 plan, BT forecast a churn rate of $>[x]<$% from April 2004, and in its September 2004 plan, it revised this forecast upward again to $>[x]<$% to apply from April 2005.

A9.19 Actual churn rates, BT forecast churn rates and Ofcom forecast churn rates are set out below.

**Figure A9.4: Sensitivity: Churn rates (December 2003 plan)**

$>[x]<$

**Figure A9.5: Sensitivity: Churn rates (September 2004 plan)**

$>[x]<$

A9.20 Ofcom applies the following churn rate assumptions in its sensitivity analysis:

9.20.1 For both the December 2003 and September 2004 plans, taking actual outturn churn rates up to March 2004 and March 2005, respectively.

9.20.2 From April 2004, and in respect of the December 2003 plan, Ofcom takes the higher churn rates BT forecasts in its later September 2004 plan on the basis that these may not have been implausibly low ($>[x]<$%).

9.20.3 From April 2005, and in respect of the September 2004 plan, Ofcom takes BT's forecast churn rate of $>[x]<$% (for BT Openworld) and $>[x]<$% (for BT Broadband).

A9.21 Ofcom considers that BT's churn rate taken from its September 2004 plan represent an appropriate sensitivity to apply over the period of the NPV analysis (including in respect of the period before 1 January 2004 because):

9.21.1 the churn rates are not so far below Ofcom's 'reasonable' rate for the forecast periods to be outside the range of possible plausible assumptions;

9.21.2 actual outturn churn rates (including before 1 January 2004) are not so far above BT's forecast churn rates forecast from 2002, December 2003 and September 2004 to suggest they lie outside the plausible range of possible forecasts taken at that time; and

9.21.3 the churn rate falls roughly halfway between Ofcom's reasonable churn rate (approximately $>[x]<$%) and BT's December 2003 forecast churn rate (approximately $>[x]<$%).

**Terminal value**

A9.22 Ofcom's test included a terminal value which reflects assumptions made by Ofcom about the value of the customer base at the end of the period considered in the NPV calculation. Ofcom derived its estimate of the value of the customer base from an assessment of BT's forecast costs. As explained in paragraph 4.118, Ofcom
considers that there was legitimate scope for doubt by BT in this early period as to the exact NPV methodology Ofcom would apply. In particular, BT might reasonably have based its forecast of the value of the customer base on the costs of customer acquisitions that it incurred during the period June 2002 to December 2003 (i.e. the period under consideration in this sensitivity analysis).

A9.23 Two features of acquisition costs in this period stand out. First, the cost of subscriber acquisitions itself fell significantly between 2002 and 2003 and in the period 2004 onwards. Indeed in the early part of the period, average customer acquisition costs were as much as £[>£] (see Figure A3.1, derived from BT’s monthly management accounts), although they fell rapidly to under £[>£] by the beginning of 2003. In addition, there was considerable volatility in the level of acquisition costs from month to month.

A9.24 In light of the downward trend and volatility in acquisition costs, one obvious and simple approach would be to take average acquisition costs for the period June 2002 to January 2004 as a whole. However this would be inappropriate for the purposes of a margin squeeze test because it would be overly influenced by the high acquisition costs in 2002 and would not adequately reflect the downward trend.

A9.25 In deciding the precise period over which to calculate the average, it is necessary to strike an appropriate balance between avoiding distortions caused by unusually high or low figures in a particular month, and removing the effect of generally higher acquisition costs in earlier parts of the period. Ofcom believes that an average over a three month period is adequate to avoid distortions due to volatility, and since the purpose of this exercise is to arrive at an estimate of customer acquisitions in the future an average from the end of the period June 2002 to December 2003 is appropriate. Ofcom has therefore used the average for the three month period immediately preceding January 2004 as the basis for its estimate of terminal value. The three month moving average of subscriber acquisition costs in this period was £[>£] (See Figure A3.1 in Annex 3. Note only the six month moving average is reported here).

A9.26 However, acquisition costs were on a short-term rising trend up to January 2004, from a minimum of around £[>£] in October 2003. Taking into account the longer term and shorter term movements in acquisition costs up to January 2004, Ofcom considers that prior to January 2004 BT could reasonably have assumed a terminal value for its consumer broadband business at the end of the NPV calculation period of up to £[>£] per subscriber.

A9.27 It can be seen from Figure A3.1 in Annex 3 that this is a conservative estimate by the standards of acquisition costs over the period. In fifteen out of the twenty months between June 2002 and January 2004, average acquisition costs were above this level.

A9.28 As noted above, Ofcom’s estimate of the MEA used in the margin squeeze test (for the September 2004 plan) is £[>£]. This is based on a forecast of acquisition costs at the end of NPV period, rather than on estimates of acquisition costs during the period prior to January 2004, from which the £[>£] figure was derived. Ofcom has also considered the range of possible terminal values which could be implied by BT’s forecasts of those costs. In particular, Ofcom has considered whether the figure of £[>£] is consistent with those forecasts.

A9.29 The estimates of BT’s acquisition costs including the £[>£] used in Ofcom’s test are derived from BT’s cost forecasts but they are not separately identified by BT. Having
considered BT’s cost forecasts, Ofcom believes that a value of £[>>] is within the bounds of reasonable assumptions, in that it is consistent with the overall cost forecasts and a reasonable interpretation of running costs. That is, given that the details of Ofcom’s method of calculating the MEA were not known, and that BT did not itself explicitly forecast acquisition costs separately, it would not have been unreasonable for BT to have used a terminal value of £[>>] in its business plans.

A9.30 Ofcom notes that, if the discretionary element of the expenditure on customer acquisition were high, this might reflect an expectation of future rewards from anti-competitive behaviour. There would then be a circularity in using BT’s spend as an indicator of the terminal value.

A9.31 Therefore, as a further check of the reasonableness of a valuation of £[>>], Ofcom has disaggregated the costs of customer acquisition during the relevant period (i.e. 2002/3) into discretionary and non-discretionary elements. At that time the non-discretionary element of cost to BT, the direct cost of connection, was £[>>]. If an allowance is then made for a reasonable level of discretionary expenditure on marketing costs etc it is possible to arrive at what might have been a reasonable assumption to make about the MEA of a customer at that time. Clearly it is difficult to identify a priori a level above which discretionary expenditure is problematic (this depends on whether it could be recovered in competitive conditions), and so this analysis is simply a cross-check of the figure derived above. However, given this, Ofcom does not consider that the amount of discretionary expenditure (just over one quarter of total acquisition costs) implied by a valuation of £[>>] per subscriber indicates an expectation of future rewards from anti-competitive behaviour.

Payback period

A9.32 In Ofcom’s test as set out in Section 4, it was considered reasonable to calculate the NPV over a five year period from 2004/05 to 2009/10. In light of the reasons set out at paragraph 4.131, Ofcom has looked at the position on a slightly longer payback period (see Figure A9.6).

A9.33 Applying a sensitivity analysis, Ofcom has considered BT’s business plans (both December 2003 and September 2004) to assess whether, prior to 1 January 2004, BT could have expected to recover its losses in a reasonable period. It notes that BT took a longer view than Ofcom as to the payback period in which it was reasonable to recover start-up losses.

A9.34 As noted earlier, Ofcom accepts that where new products are introduced to the market, there may be rational strategies for firms to incur start-up losses with the expectation of recovering these in later periods.

A9.35 This consideration seems relevant to the consumer broadband market, where consumers arguably had limited experience or awareness of the benefits of broadband initially, and where significant expenditures on marketing (product awareness) and subsidising up-front costs were undertaken by all large ISPs to gain mass market subscribers.

Contestability scenarios

A9.36 In Ofcom’s NPV analysis excluding pre-2004 losses, Ofcom considered that it was plausible for BT to have forecast increasing service margins up to –two to three years from the start of the relevant forecast period, with service margins capped from that point onward. However, Ofcom recognises that in relation to its approach
to forecasting service margins, BT could reasonably have taken a different approach prior to becoming aware of Ofcom’s position on this. Ofcom has therefore considered whether BT might reasonably have made more optimistic assumptions concerning what service margins would be achievable in a competitive market (see Figure A9.6).

A9.37 Figure A9.6 illustrates the impact on the NPV analysis of adopting the following assumptions:

9.37.1 A monthly churn rate of $>[<]%$.

9.37.2 A terminal value of £$>[<]$ per subscriber.

9.37.3 Payback periods of up to five years (from 1 January 2004).

9.37.4 Service margin increase year on year up to four and five years (from 1 January 2004).

Figure A9.6: Sensitivity Analysis results: December 2003 plan and September 2004 plan.

<table>
<thead>
<tr>
<th>£m</th>
<th>Period for NPV calculation (years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financial period</td>
<td>06/07</td>
</tr>
<tr>
<td>NPV period (from NPV start date; now 2002)</td>
<td>5</td>
</tr>
</tbody>
</table>

Period of NPV analysis before contestability is applied to service margins

| 2 years (06/07) | $>[<]$ | $>[<]$ | $>[<]$ |
| 3 years (07/08) | $>[<]$ | $>[<]$ | $>[<]$ |
| 4 years (08/09) | $>[<]$ | $>[<]$ | $>[<]$ |

A9.38 Figure A9.6 shows that, if the NPV period is up to seven years (five years from when the business plan was produced), and if the sensitivities described above in respect of churn forecasts and terminal value are applied, the negative NPV result is overturned and becomes positive for a range of reasonable contestability scenarios.