Review of the Adjustment Ratio for DLE FRIACO

Consultation document

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Summary

- **S.1** Flat Rate Internet Access Call Origination (FRIACO) is an unmetered interconnection service available from BT that is used by other Communications Providers to provide unmetered narrowband Internet access services.
- S.2 The Adjustment Ratio is used in the derivation of the regulated charges for FRIACO and captures the average number of Local Exchange Call Origination (LECO) circuits per FRIACO port. The average number of LECO circuits required can be measured by the ratio of the Erlangs Per Circuit (EPC) of FRIACO ports to the EPC of LECO circuits.
- **S.3** In November 2003, The Director General of Telecommunications ('the Director') determined BT as having significant market power ("SMP") in the wholesale fixed call origination market and imposed an SMP condition on BT requiring it to provide FRIACO at Digital Local Exchanges ('DLE FRIACO') and at tandem switches ('Single Tandem (ST) FRIACO') as a consequence (http://www.ofcom.org.uk/legacy_regulators/oftel/narrowband_mkt_rvw/fixednar rowbandstatement.pdf). In that statement at paragraph 9.12, the Director said that he was setting the value of the Adjustment Ratio at 1.78, but that updated traffic information was being collected to allow a separate consultation on the Adjustment Ratio to be published.
- S.4 Ofcom is only reviewing the Adjustment Ratio for DLE FRIACO in this consultation document. Ofcom has also obtained information from BT on FRIACO traffic at the single tandem switch. It is Ofcom's view that since the take-up of ST FRIACO is still quite limited, there is not enough information to determine a new value for the Adjustment Ratio for ST FRIACO. Consequently Ofcom does not propose to make any changes to the Adjustment Ratio used in the existing ST FRIACO charge in this Consultation.
- **S.5** Having reviewed more recent data on the utilisation of FRIACO ports, Ofcom (as the successor regulator to Oftel), is now consulting on:
 - the appropriate methodology to derive the value of the Adjustment Ratio; and
 - the value of the Adjustment Ratio for DLE FRIACO.
- **S.6** The Adjustment Ratio is currently calculated using the following ratio:

Erlangs Per Circuit (EPC) of FRIACO ports in the FRIACO Busy Hour (BH) EPC of LECO circuits in the network BH (afternoon BH)

S.7 Following empirical data provided by BT on the utilisation of call origination circuits and FRIACO ports, Ofcom considers that, although FRIACO traffic has increased significantly since 2001, instability in the FRIACO charge due to the 'shifting peak' problem has not occurred. Further, based on the observed traffic patterns, Ofcom's initial view is that is little risk of a shifting peak occurring in the future.

S.8 Ofcom is therefore proposing that the methodology for calculating the Adjustment Ratio be changed to:

EPC of FRIACO ports in the network busy hour EPC of LECO circuits in the network busy hour

S.9 Ofcom has considered a number of different approaches to setting the EPCs for FRIACO ports and LECO circuits, and the consequential impact on the value of the Adjustment Ratio. Ofcom's initial view is that there is no compelling argument or clear evidence to choose any of the resultant values of the Adjustment Ratio over the other. As the current figure of 1.78 for the Adjustment Ratio lies within the range of values considered to be plausible, Ofcom currently considers that for reasons of stability and sustainability, the existing figure of 1.78 for the Adjustment Ratio is still appropriate. Retaining the current figure would maintain the expectations of industry and would ensure business planning and predictability for Communications Providers purchasing FRIACO. Ofcom is seeking comments from stakeholders on this initial view by means of this consultation document.

Section 1 Introduction and background

- **1.1** Flat Rate Internet Access Call Origination (FRIACO) is an unmetered interconnection service available from BT that provides virtual capacity from originating customers to the point of connection of another Communications Provider. Communications Providers may choose to purchase FRIACO at Digital Local Exchanges (DLE FRIACO) or at tandem switches (Single Tandem (ST) FRIACO).
- **1.2** DLE FRIACO was made available following a direction (the "First Direction")¹ on 26 May 2000, requiring BT to provide DLE FRIACO. Single Tandem (ST) FRIACO was made available in 2001 following a second direction (the 'Second Direction')².

The legal framework

- **1.3** A new regulatory framework for electronic communications networks and services entered into force on 25 July 2003. The framework is designed to create harmonised regulation across Europe and is aimed at reducing entry barriers and fostering prospects for effective competition to the benefit of consumers. The basis for the new regulatory framework is five new EU Communications Directives:
 - Directive 2002/21/EC on a common regulatory framework for electronic communications networks and services ("the Framework Directive");
 - Directive 2002/19/EC on access to, and interconnection of, electronic communications networks and associated facilities ("the Access Directive");
 - Directive 2002/20/EC on the authorisation of electronic communications networks and services ("the Authorisation Directive");
 - Directive 2002/22/EC on universal service and users' rights relating to electronic communications networks and services, ("the Universal Service Directive") and;
 - Directive 2002/58/EC concerning the processing of personal data and the protection of privacy in the electronic communications sector ("the Privacy Directive").
- **1.4** The first four Directives were implemented in the UK on 25 July 2003. This was achieved via the Communications Act 2003 ("the Act"). The fifth Directive was adopted slightly later than the other four Directives and was implemented by Regulation which came into force on 11 December 2003.

¹<u>http://www.ofcom.org.uk/static/archive/oftel/publications/internet/fria0500.htm</u>

² <u>http://www.ofcom.org.uk/static/archive/oftel/publications/internet/fria0201.htm</u>

- 1.5 As a consequence of this 'new' regulatory regime, a number of market reviews were carried out by Director-General of Telecommunications (the "Director"). The Statement on the Fixed narrowband wholesale exchange Line, call origination, conveyance and transit markets, November 2003 (http://www.ofcom.org.uk/legacy_regulators/oftel/narrowband_mkt_rvw/fixednarrowbandstatement.pdf), concluded that BT had Significant Market Power ("SMP") in the wholesale market for fixed call origination (the 'November 2003 Statement').
- 1.6 One of the regulatory remedies imposed on BT to address its SMP in the market for wholesale call origination is the obligation to provide DLE FRIACO and ST FRIACO. This obligation is set out in SMP Condition AA12 (see page 122 of the November 2003 Statement, the "FRIACO Condition", a copy is provided in Annex 5). The charge for DLE FRIACO, as set out in the FRIACO Condition, is calculated by the following formula:

 $[D(i) \times AR(DLE)(LECO)] + D(ii) + D(iii)$

where:

"AR (DLE) (LECO)" means the Adjustment Ratio (Local Exchange call origination (LECO)) which measures the number of LECO circuits that are needed for each FRIACO port at the DLE. The AR (DLE) (LECO) Adjustment Ratio is currently 1.78.

"D (i)" means the charge for the LECO circuit as referred to in BT's charge control condition (BT's SMP Condition AA4.1(f)(i))

"D (ii)" means the charge for the FRIACO port at the Local Exchange as referred to in BT's charge control condition (BT's SMP Condition AA4.1(f)(i))

"D (iii)" means the charge for PPP (product management, policy and planning) per FRIACO port as referred to in BT's charge control condition (BT's SMP Condition AA4.1(f)(i))

- **1.7** In other words, the Adjustment Ratio (AR) is used in the derivation of the regulated charges for FRIACO. For example, in the case of DLE FRIACO it captures the average number of LECO circuits required per FRIACO port at the DLE.
- **1.8** Note that the PPP component of the FRIACO charge relates to interconnect specific costs. Ofcom is undertaking a separate review of the pence per minute PPP charge (applicable to other narrowband wholesale interconnect products), that will examine the costs, the charge control and the recovery basis of the PPP charge. The conclusions of this review may have implications for the FRIACO PPP charge; however this issue is not considered within the scope of this consultation.

The evolution of the Adjustment Ratio

- **1.9** The value of the Adjustment Ratio reflects the pattern of FRIACO traffic and its relationship to the pattern of other traffic carried on LECO circuits. The initial value of the Adjustment Ratio was originally set in the First Direction at a level of **2** using a proxy in the absence of detailed information on FRIACO traffic patterns. The Director stated that he would review the value of the Adjustment Ratio when such information became available. As the market matured and FRIACO traffic became measurable, taking into account observed utilisation patterns in June/July 2001, October 2001 and January/February and March 2002, the Director concluded in his July 2002 Determination³ that the Adjustment Ratio should be **1.78.** In the November 2003 Statement on the narrowband market review, the Director stated that he was setting the value of the DLE FRIACO Adjustment Ratio at 1.78, but was collecting updated traffic information on the utilisation of FRIACO ports and intended to publish a separate consultation on the Adjustment Ratio.
- **1.10** Having reviewed the latest available data on the utilisation of FRIACO ports provided to it, Ofcom (as the successor regulator to Oftel), is now consulting on the value of the Adjustment Ratio. In this consultation document Ofcom is consulting on:
 - the appropriate methodology to derive the value of the Adjustment Ratio; and
 - the appropriate value of the Adjustment Ratio for DLE FRIACO.
- 1.11 Ofcom has also obtained information from BT on FRIACO traffic at the single tandem. It is Ofcom's view that since the take-up of ST FRIACO is still quite limited, there is not enough information to determine a new value for the Adjustment Ratio. Consequently Ofcom does not propose to make any changes in the Adjustment Ratio used in the existing ST FRIACO charge in this consultation.

Aims of regulation

- **1.12** Ofcom exists to further the interests of citizen-consumers through a regulatory regime which, where appropriate, promotes competition. Ofcom is required to, among other things, ensure availability throughout the United Kingdom of a wide range of electronic communications services
- **1.13** As set out in the November 2003 Statement, the aim of the FRIACO Condition is to encourage competition in the provision of wholesale unmetered narrowband Internet termination services and retail unmetered narrowband Internet access services.
- 1.14 The aim of this consultation document is to review the methodology behind the DLE FRIACO Adjustment Ratio in light of changing usage patterns to ensure that the charge for DLE FRIACO continues to be at an appropriate and proportionate level. This aim takes account of the requirements set out in Sections 3 (General duties of Ofcom) and 4 (Duties for the purpose of fulfilling Community obligations) of the Communications Act 2003.

³ <u>http://www.ofcom.org.uk/static/archive/oftel/publications/internet/2002/dlefriaco0702.htm</u>

- **1.15** Ofcom has considered whether, for the purposes of Section 7 of the Communications Act 2003 (Duty to carry out impact assessments), what it is proposing is important enough for it to carry out an impact assessment under that section. However, Ofcom is not proposing to modify the FRIACO Condition or change the level of the Adjustment Ratio. It is only proposing to change the methodology used to calculate the Adjustment Ratio. Therefore, given that what is proposed does not involve a change in the FRIACO Condition and does not have a significant impact on Communications Providers or the general public, Ofcom does not consider it is necessary to carry out such an assessment.
- **1.16** Ofcom has also considered Section 6 of the Communications Act 2003 (Duty to review regulatory burdens). Ofcom has considered whether the value of the Adjustment Ratio can be determined through self-regulation and whether any issues about its value can be addressed through dispute procedures. Ofcom is of the view that FRIACO traffic patterns have shown considerable changes over the years, which has required the formulation of various options each time that the value has been determined. Since it is not possible to be certain that FRIACO traffic patterns have matured such that the Adjustment ratio value may remain stable over time, Ofcom believes that it is not yet appropriate that the value be determined through a self regulatory mechanism. However, Ofcom's views on future reviews of the Adjustment Ratio are considered at paragraph 3.32.

Section 2 Adjustment ratio methodology

Relevant principles

- **2.1** The Adjustment Ratio methodology reflects the importance of deriving FRIACO charges that:
 - i. capture cost causation; and
 - ii. are reasonably stable and sustainable.

Oftel previously set out these principles in its earlier directions on FRIACO.

2.2 Cost causation is important in order that appropriate price signals are provided to operators considering purchasing FRIACO to encourage efficient use of resources.For example, an operator's choice between metered interconnection and FRIACO should reflect the relative costs of the two forms of interconnection and not be distorted by the charge for one being artificially high or low. Ofcom recognises that stability and sustainability are important for FRIACO charges because business planning for Communications Providers purchasing FRIACO is facilitated by reasonable predictability.

The methodology used in past Directions

- 2.3 The methodology which has been used to derive the Adjustment Ratio in all previous Directions relating to FRIACO, is to take the ratio of the utilisation or Erlangs per circuit (EPC) of FRIACO ports and LECO circuits. This provides a reasonable measure of the number of LECO circuits required per FRIACO port. This is because ports carry more traffic than local exchange circuits in the busy hour (which is the relevant period for network dimensioning), and therefore each FRIACO port will require more than one local exchange circuit to support it, if the Grade of Service (GoS) (which measures the probability that a call will be unable to be established during the busy hour due to insufficient capacity being available) on the local exchange circuits is not to be reduced. A more detailed discussion of the rationale for this methodology is set out in the First Direction of May 2000 and the Discussion Paper published in November 2000 (http://www.ofcom.org.uk/static/archive/oftel/publications/pricing/fria1100.htm).
- 2.4 More specifically, the denominator of the Adjustment Ratio is the EPC of LECOs in the network busy hour. The numerator has been (up until now) the maximum (or best available proxy) EPC of FRIACO ports in the FRIACO port busy hour. Therefore

AR (DLE) (LECO) = <u>EPC of FRIACO ports in the FRIACO Busy Hour (BH)</u> EPC of LECO circuits in the network BH

2.5 In principle, the EPC of FRIACO ports **should** be assessed in the network BH and not in the FRIACO BH if the calculation has to accurately capture the costs of FRIACO in terms of the requirement on LECO circuits. However until now, the Adjustment Ratio has been calculated using the EPC of FRIACO ports in the FRIACO BH, because of the concern about the risk of the 'shifting peak' as described below.

- **2.6** Due to the flat rate (unmetered) nature of unmetered internet access, it was initially considered possible that FRIACO would be used for a large proportion of internet traffic, and that it would itself contribute to a substantial growth in general network traffic. If this turned out to be the case, FRIACO traffic could over time determine the peak usage of the network, therefore shifting the network busy hour. If the FRIACO charge had been set on the basis of an Adjustment Ratio incorporating the network BH, the possible shift of the network BH could lead to a significant (and relatively sudden) increase in the FRIACO charge.
- **2.7** There was a real possibility of such a shifting peak occurring because, although the overall network busy hour occurs in the afternoon, many LECOs experience their individual peaks at other times, such as the evening. As shown in Table 1 and Figure 1, although the EPC of LECOs is highest in the afternoon, the figures in the morning and evening are only slightly lower. When FRIACO was first introduced, it was anticipated that the growth in FRIACO traffic might increase the overall volume of traffic on LECOs in the evening relative to other times of day. This might have resulted in an increased likelihood of the network busy hour shifting from the afternoon to the evening period. This outcome could have been disruptive and undesirable and would have been against the Director's objective of maintaining stability and sustainability of the FRIACO charge. The Director therefore considered it preferable in the July 2002 Determination to use the EPC of FRIACO ports in the evening busy hour in the calculation of the Adjustment Ratio.

EPC of LECOs									
	Jun-02	Jul-02	Aug-02	Sep-02	Oct-02	Nov-02	Dec-02	Jan-03	Feb-03
Morning BH	0.309	0.319	0.319	0.313	0.316	0.323	0.311	0.295	0.324
Afternoon BH	0.325	0.330	0.314	0.325	0.343	0.351	0.345	0.310	0.359
Evening BH	0.317	0.317	0.297	0.313	0.327	0.330	0.324	0.297	0.339
	Mar-03	Apr-03	May-03	Jun-03	Jul-03	Aug-03	Sep-03	Oct-03	
Morning BH	0.319	0.310	0.309	0.308	0.310	0.312	0.308	0.308	
Afternoon BH	0.345	0.323	0.332	0.322	0.320	0.306	0.324	0.334	
Evening BH	0.330	0.312	0.321	0.312	0.309	0.290	0.309	0.316	

Table 1: EPCs of LECOs in morning, afternoon and evening

Source: BT (information relates to the average across all LECOs in each of the periods shown)



Figure 1: Average monthly EPC of LECO circuits in the morning, afternoon and evening busy hours

Source: BT data

The proposed methodology

- **2.8** Ofcom is now reviewing the Adjustment Ratio for DLE FRIACO under the terms of the FRIACO Condition. As part of this review, Ofcom has requested BT to provide historical trend data on the utilisation of FRIACO ports and LECO circuits. Ofcom is of the view that an analysis of a time trend is useful in understanding the patterns in the usage of FRIACO ports. This is particularly so because about 18 months have passed since the July 2002 Determination was made on the Adjustment Ratio, which has enabled a longer time series to be considered. Ofcom also considers that a significant length of time has passed since FRIACO-based products have been commercially available and that time series data might provide indicators of whether the market has matured.
- **2.9** The graph below (Figure 2) shows the trend of the average monthly EPC of FRIACO ports in the FRIACO BH (evening) and the average monthly EPC of the LECO circuits in the network BH (afternoon).



Figure 2: FRIACO evening (eve) EPC and LECO afternoon (pm) EPC

Source: BT data

2.10 As can be seen from the above graph, the EPC of FRIACO ports in the FRIACO BH has been rising over time, with similar seasonal fluctuations each year. Figures provided by BT also indicate that FRIACO traffic has generally increased during this period, although there has been a decline over July to October 2003. Figure 3 illustrates the change in the pattern of FRIACO traffic.



Figure 3: FRIACO ports and FRIACO busy hour traffic per month

Source: BT data

- 2.11 The EPC of FRIACO ports in the network BH has increased, however the EPC of FRIACO ports in the FRIACO BH has also increased. On the other hand, the EPC of LECO circuits in the network BH has fallen, however the EPC of LECO circuits in the FRIACO BH has also fallen. This seems to indicate that the rise in FRIACO traffic has not made a significant impact on the utilisation of LECO circuits in the LECO BH. As illustrated in Table 1, the afternoon period is still the busiest period for the network. It appears therefore that the increase in the EPC of FRIACO ports has not led to a shifting of the afternoon peak.
- **2.12** However, the above data alone do not indicate whether the risk of the peak shifting has passed. The EPC of FRIACO ports in the FRIACO BH is generally higher in 2003 compared to 2002. If this previous increase had increased the EPC of FRIACO ports in the evening BH more than the afternoon BH, and if such a trend was expected to continue, then there may be continuing concerns about the possibility of the shifting peak.
- **2.13** To understand whether this might be the case, Ofcom requested BT to provide information on the EPC of FRIACO ports in the network BH and the morning BH⁴.

These adjusted figures are tabulated in Table 2 and graphically illustrated in Figure 4.

EPC of FRIACO ports									
	Jun-02	Jul-02	Aug-02	Sep-02	Oct-02	Nov-02	Dec-02	Jan-03	Feb-03
Morning BH	0.369	0.375	0.374	0.350	0.351	0.354	0.324	0.368	0.388
Afternoon BH	0.497	0.483	0.446	0.473	0.493	0.513	0.475	0.538	0.561
Evening BH	0.596	0.583	0.542	0.567	0.588	0.599	0.542	0.606	0.645
	Mar-03	Apr-03	May-03	Jun-03	Jul-03	Aug-03	Sep-03	Oct-03	
Morning BH	0.381	0.425	0.428	0.434	0.442	0.461	0.432	0.426	
Afternoon BH	0.560	0.552	0.618	0.573	0.567	0.544	0.595	0.609	
Evening BH	0.660	0 654	0 710	0 690	0.676	0.638	0.689	0 704	

Table 2: EPCs of FRIACO ports in morning, afternoon and evening

Source: BT (information relates to the average of weeks across all ports in each of the periods shown)

⁴ The figures provided by BT for the time series are composed of data that includes a small proportion of FRIACO ports that may be unutilised, ie.ports which are registered on BT's database, but may not necessarily be carrying FRIACO traffic. This 'unvalidated' data can be compared to five months of 'validated data' that includes only FRIACO circuits in actual use. The difference between such unvalidated data and the validated data available for a number of months is on average about 1.7%. Therefore the EPCs from the unvalidated data have been corrected for this difference, such that the assumed actual EPC for each month is 1.7% higher than that observed from the unvalidated data.



Figure 4: EPC of FRIACO circuits in the different busy hours

Source: BT data

- 2.14 Table 2 and Figure 4 show that as FRIACO traffic has increased, the EPC of FRIACO ports has increased in all the Busy Hours of each month in 2003 compared to 2002 (comparison of equivalent months in the previous year is necessary in order to remove the effect of seasonal variations). Indeed, for the equivalent months shown (June-October), the increase in the EPC of FRIACO ports has been higher in the afternoon BH than the evening BH. This indicates that although FRIACO traffic has been increasing, the increase has been spread throughout the day. The high FRIACO EPCs in the network BH (afternoon BH) indicates that increased FRIACO traffic is likely to have a similar impact on the EPC of LECO circuits in the afternoon period as it does in the evening period.
- 2.15 This is borne out by the illustration of the pattern of traffic in the evening BH and the afternoon BH as shown in Figure 5. As can be observed from the figure, FRIACO traffic in the afternoon BH has grown at least as rapidly as traffic in the evening BH. In addition, the number of FRIACO ports in use has started to decline (Figure 3) which has the effect of reducing the traffic in the evening BH, more than that in the afternoon BH (due to the higher EPCs in the evening BH).



Figure 5: FRIACO traffic in the Network busy hour (pm) and FRIACO busy hour (eve)

Source: BT data

2.16 There is no indication therefore that an increase in FRIACO traffic would imply higher increases in the LECO EPCs in the evening BH than in the afternoon BH. While there may be seasonal variations in the FRIACO EPCs because the longer daylight hours in the summer might spread the FRIACO traffic over the day, the higher FRIACO EPCs in the evening have not resulted in the network peak shifting from afternoon to evening. As a further example of this, consider Figure 6 which provides a comparison of the EPCs in both the afternoon (network) and the evening (FRIACO) busy hours.



Figure 6: Comparison of LECO and FRIACO EPCs in the Afternoon (pm) BH and Evening (eve) BH

Source: BT data

- 2.17 As can be observed from Figure 6, the highest FRIACO EPC in the evening (FRIACO) BH was 0.710 and occurred in May 2003. However, one of the months when FRIACO traffic was highest is June 2003 (see Figure 3). If this high volume of FRIACO traffic were to cause a shift in the network BH from the afternoon to the evening, the impact would be seen on the relative LECO EPCs in the evening and afternoon BHs ie., the evening LECO EPCs would rise relative to the afternoon (pm) LECO EPCs. However, the LECO EPC in the evening BH is still lower than that in the afternoon BH in June 2003, showing that the shift did not take place even during the period which had a high level of traffic.
- **2.18** On the other hand, May 2003 not only had the highest FRIACO EPC in the evening BH, but also the highest FRIACO EPC in the network BH. This resulted in a rise in the LECO EPC in the evening BH as well as the afternoon BH. A similar situation occurred in October 2003. Although the FRIACO EPC in the evening BH was 0.704, it did not have the effect of raising the LECO EPC in the evening BH beyond that in the afternoon BH. This was because the FRIACO EPC in the afternoon BH rose as well, thereby increasing the LECO EPC in the afternoon BH.
- **2.19** It thus appears that even if the FRIACO EPC were to increase in the evening, there is a strong likelihood that the FRIACO EPC would also increase in the afternoon (the network BH). This would result in an increase in the afternoon traffic (and hence LECO EPC in the afternoon BH) and retain the afternoon BH as the network peak. Based on the trend shown in Figure 3, it is also likely that FRIACO demand levels have stabilised. This would also indicate that the FRIACO evening EPCs may not rise significantly higher than present levels.
- **2.20** Ofcom therefore has few concerns about the shifting peak as there has been no indication so far that an increase in FRIACO traffic has shifted the network peak from afternoon to evening. The increase in FRIACO traffic has also prompted an increase in the afternoon BH, thereby retaining the afternoon BH as the network BH.
- 2.21 Since the Adjustment Ratio is intended to measure the average number of LECO circuits required per FRIACO port, Ofcom believes that the FRIACO EPC in the network BH is more appropriate for providing the right signals for such investment. This is because the price of a FRIACO port should reflect the additional investment required to support the provision of the FRIACO service. Additional investment will only be required in BH periods, since the existing LECO circuits could suffice to meet FRIACO demand during periods of lower network utilisation. Since the afternoon BH is the period when the network utilisation is the highest, an Adjustment Ratio based on the ratio of FRIACO and LECO EPCs in the network BH will more appropriately reflect cost causation and efficient pricing.
- **2.22** Ofcom is therefore proposing that the methodology for the Adjustment Ratio should be based on the EPC of the FRIACO ports in the network BH and the EPC of LECO circuits in the network BH. More specifically, the formula proposed for the calculation would be:

AR (DLE) (LECO) = <u>EPC of FRIACO ports in the network busy hour</u> EPC of LECO circuits in the network busy hour

More complex methodology

- **2.23** In the November 2000 Discussion Paper, a more complex methodology to derive the Adjustment Ratio was analysed and discussed. Additional traffic on LECOs will only give rise to a requirement for additional LECO circuits if it arises in the individual busy hour of those LECOs. The more complex methodology would use disaggregated information on the EPCs of LECOs and FRIACO ports and traffic patterns in an attempt to build up the number of LECO circuits required on average per FRIACO port.
- **2.24** The advantage of the more complex methodology is that it should provide a closer reflection of cost causation. However, a key disadvantage is that some of the information required to implement the more complex methodology is not available. This information is the volume of FRIACO Erlangs in the morning (afternoon, evening) that originate on LECOs which have an individual busy hour in the morning (afternoon, evening). It is not available because BT is unable to distinguish FRIACO and non-FRIACO traffic on LECOs. In the absence of this information, assumptions would need to be made to implement the more complex methodology.
- **2.27** In previous responses to the Discussion Paper, both BT and other Communications Providers had expressed a preference for the current methodology over the more complex methodology, either because it was better understood or because information to implement it was more readily available.
- **2.28** Continuing with this approach, the focus in this review is to update the value of the Adjustment Ratio with the proposed new methodology, but not the complex methodology previously discussed. Nevertheless Ofcom has explored the implications of using the more complex methodology to provide a cross-check on the reasonableness of the updated Adjustment Ratio. This is set out in Annex 3.

Section 3 Appropriate value of the Adjustment Ratio

3.1 This section considers the values of the two inputs to the Adjustment Ratio calculation; LECO EPC in the network BH and FRIACO EPC in the network BH, and the value of the Adjustment Ratio itself.

LECO EPC

- **3.2** The Adjustment Ratio is intended to capture the average number of LECO circuits required per FRIACO port. Since ports carry more traffic than local exchange circuits in the busy hour (which is the relevant period for network dimensioning), each FRIACO port will require more than one local exchange circuit to support it, if the Grade of Service on the local exchange circuits is not to be reduced. An indicator of the average number of circuits required is the average EPCs of LECO circuits in the network busy hour. This is the denominator in the formula for the Adjustment Ratio. As can be observed from Figure 1, the average monthly EPC of LECO circuits has been lower in 2003 than in 2002.
- **3.3** In past Directions on the value of the Adjustment Ratio, the Director has relied on empirical data to inform him on the 'mature level' of the EPC of FRIACO ports and LECO circuits. Since data was only available at discrete data points, a combination of the most recent data available and a forecast of a mature level was used to determine the EPCs required to set the value of the Adjustment Ratio. With the availability of a longer data time series now however, there are several ways in which an average EPC for FRIACO ports and LECO circuits can be calculated.
- **3.4** In considering an appropriate value of the LECO EPC, Ofcom is of the view that the two most important criteria are that of cost causality and consistency with metered wholesale charges. This is because LECO circuits are also used to provide metered call origination and any discrepancy between the average charges for a LECO circuit when used for FRIACO (unmetered) based products and when used for metered origination based products will lead to distortions in consumer choice between metered and unmetered internet access. Hence, consistency will be required in the treatment of the LECO circuit charge between metered and unmetered wholesale products. In practice, this consistency with metered charges means consistency with the Network Charge Control (NCC). Note that the objectives of cost causality and stability apply to the value of the Adjustment Ratio since the Adjustment Ratio directly impacts on the price for FRIACO; however, since the cost of the LECO circuit used to charge for FRIACO is also used to charge for metered services, the objective of consistency between FRACO and metered services is more important to determining the LECO EPC figure.
- 3.5 Ofcom has considered two approaches for the calculation of LECO EPCs:

a. Average of actual LECO EPC over the last 6 months of available data (May-October 2003)

3.6 This approach most closely reflects cost causality as the costs of providing FRIACO depends on the number of LECO circuits used, which is a function of

the utilisation of each circuit. The LECO EPC has declined from a peak of 0.36 (March 2002) when the Adjustment Ratio was last reviewed. Indeed, over the whole of 2003, the LECO EPC has been persistently lower than 2002.

3.7 Ofcom's market information shows (Figure 7) that the total volume of calls originating on BT's network has started to fall slightly and therefore, it could be argued that the latest monthly EPCs (ie the latest 6 months) are more representative of the future utilisation of the network.



Figure 7: BT fixed call volumes

3.8 If 2003 represents the current utilisation of LECO circuits, and there is no *a priori* reason why this EPC might rise higher (indeed overall traffic has fallen in the last quarter compared to similar periods in previous years), then it could be argued that an average of the last available six months' worth of data (May-Oct 2003) is representative of the EPC of LECO circuits. This six-month average figure is **0.323**.

- **3.9** However, using this six-month average figure would not be consistent with the EPC implicit in metered charges which are controlled by the Network Charge Control and are based on forecasts. This would imply that unmetered charges would become more expensive relative to metered charges. This is discussed further in (b) below.
- **3.10** In addition, the six month average (May-October 2003) would not rule out seasonal effects because it captures 3 summer months when the usage of the network is low relative to other times of the year.

b. The value of LECO EPC currently used in the Adjustment Ratio formula (0.36)

3.11 Consistency with the EPC implicit in metered charges was not explicitly considered in previous Determinations because the LECO EPC used then (0.35-0.36) did not significantly differ from the EPC implicit in the metered charges when the second charge control period started (October 2001). Empirically however, the LECO EPC has been lower in 2003 than in 2002,

which would mean that the latest figures should be applied to ensure cost causality. But ensuring cost causality will mean that consistency with the EPC implicit in metered charges may be affected. Consistency in charges between unmetered and metered charges is important to ensure that consumer choices are not distorted between metered and unmetered internet access.

- **3.12** The network charge controls provide BT the incentive to minimise its costs by allowing it the flexibility to vary charges of individual components within a basket from a cost-reflective level as long as they collectively conform to the basket cap. In that respect therefore, the network charge controls make a trade-off between providing incentives to BT and achieving cost causation.
- **3.13** Consistency between LECO charges when used for metered and unmetered origination therefore requires the same level of trade-off between cost causation and cost minimisation incentives. Any divergence in the level of the tradeoff compared to that made when setting the charge controls would lead to a certain level of inconsistency.
- **3.14** Consistency can be ensured by using the same EPC that is implicit in the network charge control charges. The network charge control is however, based on a forecast of volumes and corresponding network costs, and not on an explicit forecast of EPCs. The charge control calculations were based on a forecast of increasing average minutes per circuit over the period 2001-2005. In order to use this information to derive the forecast EPC in the busy hour, it is necessary to know the forecast percentage of traffic that flows in the busy hour relative to other times of the day. Since this forecast was not required or made in the charge control model, it is not possible to judge what the forecast *implied* EPC is at this point of the charge control period. However, when the Network Charge Control was set, it was not expected that the EPCs in the network BH would fall, even if the Cost-Volume Elasticities (CVEs) implied a flatter traffic profile.
- **3.15** Ofcom's proposed view is that a practical option is to use 0.36 which is the value of the LECO EPC used in the derivation of the current value of the Adjustment Ratio and is a small increase on the EPC that was actually estimated in 2001 at the beginning of the charge control period (which was 0.35). Such a figure would be consistent with the charge control assumption of increasing average minutes per circuit.
- **3.16** Ofcom's proposed view is that while approach (a) would ensure cost causality, approach (b) would ensure consistency with metered charges, which results in stability of the value used.
- **3.17** Ofcom considers that each approach of estimating the average LECO EPC has both merits and limitations and therefore some weight should be given to each approach. The table below provides possible estimates of the LECO EPCs that can be used for the calculation of the Adjustment ratio.

Table 5: Average EPCS of LECOS in the network BH					
Average over 6 months (May 2003 – October 03)	0.323				
Average used in the past	0.360				

Table 3: Average EPCs of LECOs in the network BH

FRIACO EPC

3.18 The numerator in the formula for the Adjustment Ratio is the EPC of FRIACO

ports in the network busy hour. Ofcom considers that two important criteria for the appropriate level of FRIACO EPCs are: i) a reflection of mature levels of EPC for FRIACO ports (to ensure stability of prices) and ii) control for seasonal variation. Ofcom has considered two underlying approaches for the calculation of the average FRIACO EPC:

a. Average FRIACO EPC over the last available 6 months (May-October 2003)

- **3.19** This approach uses the most recent data which captures the stabilising of FRIACO traffic over this period (see Figures 2 and 3) and could be argued to be representative of the mature level of utilisation of FRIACO ports. This gives a value of **0.584** as the FRIACO EPC level.
- **3.20** However, such an approach may not *sufficiently control for seasonal variations*, since it uses the summer months when the traffic on the network is generally lower relative to other times of the year. This might lead to an underestimate as the summer months typically have lower EPCs.

b. An average of 12 months with a forward look (May 2003-April 2004):

- **3.21** If the average of the last six months of available data might be an underestimate since seasonal effects are included, it is possible that a longer time series such as 12 months might remove such seasonal effects.
- **3.22** However, using the last available 12 months' worth of data (November 2002-October 2003) might also underestimate the mature level as it includes periods when FRIACO traffic was still growing. This 12 month average results in an EPC figure of 0.559. Ofcom believes that a figure of 0.559 as an average FRIACO EPC figure in the network busy hour is not representative of a mature level. This implies that any Adjustment Ratio based on this figure will underprice the FRIACO charge by indicating that it is less expensive to provide LECO circuits for meeting FRIACO demand than is actually the case.
- **3.23** Ofcom considers that a mature level for the FRIACO EPC could be estimated by using data of May-October 2003, and projecting data for six months forward (November 2003- April 2004), based on historical trends and allowing for seasonal effects. Since the FRIACO EPCs rose by a higher percentage between 2001 and 2002 than between 2002 and 2003, this approach will not only take into account such past growth rates, but also ensure that the data is not affected by seasonal factors.
- **3.24** Ofcom carried out a regression of past EPC data over time, allowing for seasonal effects. Based on the forward projections, an average EPC was estimated for the period May 2003 April 2004. This value is **0.604**. Details of the calculations are provided in Annex 4.
- **3.25** Ofcom believes that the forecast is robust as it takes into account both the seasonal variations and the slow down in the underlying increase in the FRIACO EPC and this could therefore appear to be a mature EPC level. However, the inherent nature of forecasts is that they carry some risk of forecast error. Ofcom is of the view again that both the approaches (a) and (b) used for the determination of the average FRIACO EPC have some merits and limitations and some weight should be accorded to each approach.

The Adjustment Ratio

3.26 Based on the approaches described above for estimating average LECO EPCs and average FRIACO EPCs (both in the network BH), Table 4, illustrates the values of the Adjustment Ratio that would result under each of the four possible combinations.

Table 4:	Com	parison	of AR	values
	•••	parioon	0.7	Tala00

		FRIACO EPC i	n network BH
	(Current AR = 1.78)	(1) 6 month average (0.584) Assumes utilisation has matured, but may underestimate due to seasonal effects	(2) Forecast 12 month average (0.604) Projects the last 6 months data forward 6 months taking into account the slow down in the underlying increase in EPC and seasonal variations
twork BH	(A) Average over last 6 months (0.323) Most closely reflects cost causality, but not consistent with metered charges	1.81	1.87
LECO EPC in ne	(B) Value currently used for AR (0.36) The value of LECO EPC currently used in the AR formula. More consistent with the network charge control (ie metered charges)	1.62	1.68

- **3.27** Ofcom believes that each of the above values for the Adjustment Ratio has some merit as each is in keeping with some of the objectives of cost causality, stability, maturity and consistency. Ofcom's initial view that there is no compelling argument or clear evidence to choose any one value over the other. As the current figure of 1.78 for the Adjustment Ratio lies within the range of values considered to be plausible, Ofcom believes that for reasons of stability and sustainability, the current figure of 1.78 is still appropriate. Retaining the current figure would maintain the expectations of industry and would ensure business planning and predictability for Communications Providers purchasing FRIACO.
- **3.28** Ofcom therefore proposes that the value of the Adjustment Ratio be retained at **1.78**.

Retrospection

3.29 Although Ofcom is not proposing to change the value of the Adjustment Ratio, for the avoidance of doubt, it should be emphasised that the Adjustment Ratio is forward looking. Any changes to the Adjustment Ratio have in the past always taken effect going forward and have had no retrospective element. This is consistent with the aim of seeking to achieve stability and support business planning.

Single Tandem FRIACO

- 3.30 In principle, the appropriate value of the AR (LECO)⁵ might be different between DLE and Single Tandem FRIACO. This is because the EPC of FRIACO ports might be different at DLEs and tandem switches. For example, it might be possible to achieve higher utilisation of FRIACO ports at tandem switches, because of the benefits of greater concentration of traffic and larger route sizes. If so, a higher value of AR (LECO) should apply in the calculation of the charge for ST FRIACO compared to DLE FRIACO.
- **3.31** In the July 2002 Determination, the Director proposed to retain the value for the Adjustment Ratio of **2.00** (set in the Second Direction), in the calculation of the Single Tandem FRIACO charge, because no specific evidence on the use of ST FRIACO ports was available that suggested that the value should be changed. Ofcom notes that there is still no evidence available to support a case for changing the current value as there has been very little take-up of ST FRIACO. Therefore, Ofcom is not proposing any change to the value of the Adjustment Ratio for Single Tandem FRIACO. As in the earlier Determination, the AR (LECO), which is the Adjustment Ratio reflecting the number of LECO circuits required per FRIACO port, will take on a different value for DLE FRIACO from that applicable for Single Tandem FRIACO.

Future reviews of the Adjustment Ratio

3.32 Ofcom is of the view that the Adjustment Ratio is intended to capture the mature usage of FRIACO ports in the network busy hour and measures the number of LECO circuits that are required to meet that usage in the network busy hour. As has been evident from the data available to Ofcom, the EPC of FRIACO ports has risen in 2003, whereas the EPC of LECO circuits has fallen during this period. Given the changing pattern of both FRIACO traffic and general network traffic, Ofcom is of the view that it would be appropriate to review the Adjustment Ratio again in the future. Ofcom does not believe that it is clear that traffic trends have stabilised sufficiently to allow the Adjustment Ratio to be fixed at a certain level. Ofcom considers that the most appropriate point to review the Adjustment Ratio again would be at the same time as the next network charge control review. At this point, Ofcom intends to, amongst other things, to consider whether it would be appropriate to incorporate the Adjustment Ratio into the FRIACO charge control and therefore enable it to withdraw from detailed regulation of the Adjustment Ratio in the future.

⁵Note that another adjustment ratio AR (LT) is also used in calculating the ST FRIACO charge. AR(LT) measures the number of local tandem (LT) circuits that are needed for each FRIACO port at the tandem exchange. Consideration of AR(LT) is outside the scope of this consultation.

Section 4 The consultation process and next steps

How to respond to this consultation

Of com invites written views and comments on the issues raised in this document, to be made by **5pm on May 21, 2004.**

Ofcom strongly prefers to receive responses as e-mail attachments, in Microsoft Word format, as this helps us to process the responses quickly and efficiently. Please can you send your response to <u>Justin.moore@ofcom.org.uk</u>

Responses may alternatively be posted or faxed to the address below, marked with the title of the consultation.

Justin Moore Project Manager and Technical Advisor Competition and Markets 4th Floor Ofcom Riverside House 2A Southwark Bridge Road London SE1 9HA

Fax: 020 7981 3333

Note that we do not need a hard copy in addition to an electronic version. Also note that Ofcom will not routinely acknowledge receipt of responses.

It would help if you can explain why you hold your views, and how Ofcom's proposals would impact on you.

Further information

If you have any questions about the issues raised in this consultation, or need advice on the appropriate form of response, please contact Justin Moore on 020 7783 4167.

Confidentiality

Ofcom thinks it is important for everyone interested in an issue to see the views expressed by other consultation respondents. We will therefore usually publish all responses on our website, <u>www.ofcom.org.uk</u>, as soon as possible after the consultation period has ended.

All comments will be treated as non-confidential unless respondents specify that part or all of the response is confidential and should not be disclosed. Please place any confidential parts of a response in a separate annex, so that non-confidential parts may be published along with the respondent's identity.

We would be grateful if you could speed up our response-handling processes by completing a response cover sheet (see Annex 2) to indicate whether or not there are confidentiality issues. The cover sheet can be downloaded from Ofcom's website from the page where this consultation document appears.

Please also note that copyright in responses will be assumed to be relinquished unless specifically retained.

Next steps

Following the end of the consultation period, Ofcom intends to publish a statement around August 2004.

Please note that you can register to get automatic notifications of when Ofcom documents are published, at <u>http://www.ofcom.org.uk/static/subscribe/select_list.htm</u>.

Ofcom's consultation processes

Ofcom is keen to make responding to consultations easy, and has published some consultation principles on its web site (<u>http://www.ofcom.org.uk/consultations/consult_method/ofcom_consult_guide?a=871</u>01) which it seeks to follow, including on the length of consultations.

This consultation is shorter than Ofcom's standard 10 week period because Ofcom considers that the proposed value of the Adjustment Ratio is not amending the existing SMP Condition for FRIACO and therefore not materially changing the regulation on BT or impacting other Communication Providers. In addition, it is of the view that this issue is of limited direct interest to consumers and that the main the parties likely to be affected (namely BT and other Communication Providers that purchase FRIACO) have been notified of the consultation and the shorter consultation period.

If you have any comments or suggestions on how Ofcom conducts its consultations, please call our consultation helpdesk on 020 7981 3003 or e-mail us at <u>consult@ofcom.org.uk</u>. We would particularly welcome thoughts on how Ofcom could more effectively seek the views of those groups or individuals, such as small businesses or particular types of residential consumers, whose views are less likely to be obtained in a formal consultation.

If you would like to discuss these issues, you can alternatively contact Philip Rutnam, Partner, Competition and Strategic Resources, who is Ofcom's consultation champion:

Philip Rutnam Ofcom Riverside House 2A Southwark Bridge Road London SE1 9HA Tel: 020 7981 3585 Fax: 020 7981 3333 E-mail: philip.rutnam@ofcom.org.uk

Annex 1 Ofcom's consultation principles

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

Before the consultation

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

During the consultation

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

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

4 We will normally allow ten weeks for responses, other than on dispute resolution.

5 There will be a person within Ofcom who will be in charge of making sure we follow our own guidelines and reach out to the largest number of people and organisations interested in the outcome of our decisions. This individual (who we call the consultation champion) will also be the main person to contact with views on the way we run our consultations.

6 If we are not able to follow one of these principles, we will explain why. This may be because a particular issue is urgent. If we need to reduce the amount of time we have set aside for a consultation, we will let those concerned know beforehand that this is a 'red flag consultation' which needs their urgent attention.

After the consultation

7 We will look at each response carefully and with an open mind. We will give reasons for our decisions and will give an account of how the views of those concerned helped shape those decisions.

Annex 2

Consultation response cover sheet

A2.1 In the interests of transparency, we will publish all consultation responses in full on our website, <u>www.ofcom.org.uk</u>, as soon as possible after the consultation period has ended, unless a respondent specifies that all or part of their response is confidential. We will also refer to the contents of a response when explaining our decision, unless we are asked not to.

A2.2 We have produced a cover sheet for responses (see below) and would be very grateful if you could send one with your response. This will speed up our processing of responses, and help to maintain confidentiality by allowing you to state very clearly what you don't want to be published. We will keep your completed cover sheets confidential.

A2.3 We strongly prefer to receive responses in the form of a Microsoft Word attachment to an email. Our website therefore includes an electronic copy of this cover sheet, which you can download from the 'Consultations' section of our website.

A2.4 Please put any confidential parts of your response in a separate annex to your response, so that they are clearly identified. This can include information such as your personal background and experience. If you want your name, contact details, or job title to remain confidential, please provide them in your cover sheet only so that we don't have to edit your response.

Cover sheet for response to an Ofcom consultation

BASIC DETAILS					
Consultation title:					
To (Ofcom contact):					
Name of respondent:					
Representing (self or o	rganisation/s):				
Address (if not received by email):					
CONFIDENTIALITY					
What do you want Ofco	om to keep confidential?				
Nothing	Name/contact details/ job title				
Whole response	Organisation				
Part of the response	If there is no separate a	nnex, which parts?			
If you want part of your response, your name or your organisation to be confidential, can Ofcom still publish a reference to the contents of your response (including, for any confidential parts, a general summary that does not disclose the specific information or enable you to be identified)?					
Yes	No				
<u> </u>					

DECLARATION

I confirm that the correspondence supplied with this cover sheet is a formal consultation response. It can be published in full on Ofcom's website, unless otherwise specified on this cover sheet. If I have sent my response by email, Ofcom can disregard any standard email text about not disclosing email contents and attachments.

Name	Signed (if hard copy)
Name	Signed (if hard copy)

Annex 3 More Complex Methodology

A3.1 In this Annex the application of a more complex methodology for calculating the Adjustment Ratio is explored. This provides a cross-check on the reasonableness of the updated value for the Adjustment Ratio for DLE FRIACO derived using the current methodology as proposed in the body of this consultation document.

Source data

- A3.2 The more complex methodology considers the coincidence between FRIACO traffic on LECOs at times of day when those particular LECOs are experiencing their individual busy hours, ie the morning, afternoon and evening. When LECOs are outside their individual busy hours no additional capacity is needed to serve FRIACO traffic.
- A3.3 As an illustration for October 2003 (which is the most recent month for which data is available and which also involves relatively high FRIACO EPCs), Table 4 shows the EPCs in the morning, afternoon and evening busy hour periods for each of three categories of LECOs: those experiencing their individual busy hours in respectively the morning, afternoon and evening. The focus of interest is on the figures on the diagonal of Table 5 (shown in bold), the EPCs of LECOs when they are experiencing their individual busy hours.

	Morning BH	Afternoon	Evening BH	Share of total
	-	BH		circuits
Links with morning BH	0.301	0.284	0.168	33%
Links with afternoon BH	0.275	0.289	0.193	16%
Links with evening BH	0.323	0.383	0.454	51%
Overall average	0.308	0.335	0.317	

Table 5: LECO EPCs (October 2003)

Source: BT

A3.4 Table 6 shows the proportion of traffic in each of the morning, afternoon and evening busy hour periods that arises on each of the 3 categories of LECOs. Again, the focus is on the figures on the diagonal, because this is the traffic that arises on LECOs inside their individual busy hours. Ideally, the information in Table 6 would relate specifically to FRIACO traffic. However, BT is unable to supply such data, so Table 6 shows the proportions for all traffic on LECOs, including both FRIACO and non-FRIACO traffic. It is not known how this information compares to the pattern of FRIACO traffic on LECOs and, in principle, the figures on the diagonal could overstate or understate the true figures.

Table 6: Proportion of total traffic on LECOs (including non-FRIACO) in each time of day that originates on LECOs in individual busy hour

	Morning BH	Afternoon	Evening BH	Share of total			
		BH		circuits			
Links with morning BH	33%	28%	18%	33%			
Links with afternoon BH	14%	14%	10%	16%			
Links with evening BH	53%	58%	72%	51%			
Overall average	100%	100%	100%				

Source: Ofcom from information provided by BT Note: Figures are derived from Table 4 (eg 39% = 0.299 x 39%/0.307)

A3.5 The other relevant information to implement the more complex methodology is the amount of FRIACO traffic in each of the morning, afternoon and evening busy hour periods. This is shown in Table 7.

	voo ports in morning,	and cycling	Y
Average EPC of all FRIACO ports	Morning BH	Afternoon BH	Evening BH
October 2003	0.419	0.611	0.708
0 07			

Table 7: EPCs of FRIACO ports in morning, afternoon and evening

Source: BT

Illustrative results using more complex methodology

A3.6 An illustrative calculation using the more complex methodology is set out in Table 7. Row A is the information on FRIACO EPCs from Table 6. Row B is the diagonal from Table 5 and row C is the diagonal from Table 4. The number of LECOs required on average per FRIACO port is then calculated in the bottom row. It is the number of Erlangs of FRIACO traffic per port originating on LECOs experiencing an individual busy hour (A x B). This is divided by the Erlangs per circuit for that category of LECO experiencing its individual busy hour at that time of day (C). No additional LECO circuits are required for those LECOs that are outside their individual busy hours. With the data and assumptions in Tables 4 to 6, summing across the circuit requirements in each busy hour period yields an Adjustment Ratio using the more complex methodology of 1.88.

Table	7:	Illustrative	calculation	of Ad	iustment	Ratio
	•••	maonanvo	ouroundion	0.7.0	Jaounone	

	· · · · · ·	AM	PM busy	Eve	Total
		b	ho	bu	
		u	ur	sy	
		S		ho	
		У		ur	
		h			
		0			
		u			
		r			
А	FRIACO EPCs in each time of day – average of	0.419	0.611	0.708	
	all FRIACO ports				
	 Measured EPCs in October 2003 				
В	Proportion of FRIACO traffic in each time of day	33%	14%	72%	
	that originates on LECOs in individual busy				
	hour				
С	EPCs of LECOs in individual busy hour	0.301	0.289	0.454	
	Adjustment ratio (A×B ÷C)	0.45	0.30	1.13	1.88

Conclusion

A3.7 It would not be appropriate to draw a firm conclusion from this analysis of the application of the more complex methodology. This is because of the non-availability of some of the relevant information, ie the proportion of FRIACO traffic in each period that originates on LECOs experiencing their individual

busy hours. It is possible that the proportions assumed here are either overstated or understated. Nevertheless the analysis suggests that the proposed Adjustment Ratio of 1.78, derived using the new methodology (and as proposed in the body of this consultation document) is reasonable as it lies fairly close to the value of 1.88 for October 2003 derived using the more complex methodology.

Annex 4 Calculation of the 12 month forward look average FRIACO EPC

A4.1 A linear equation of the following form was used:

$Y = a + b \times X + c \times Z$

- **A4.2** In this equation, Y is the historical FRIACO EPCs in the network BH, X is a month (time) factor and Z is a dummy variable used to capture seasonal effects. Z takes values 1 in the months of June, July, August and December when FRIACO traffic slows down relative to other parts of the year.
- A4.3 The regression was run on monthly data available from June 2002 to October 2003. This regression produced an R^2 of 0.86 and a standard error of 0.02.
- **A4.4** Using the values of the coefficients estimated, monthly FRIACO EPCs for the future 6 months (November 2003 –April 2004) are calculated. The average of the FRIACO EPCs from May 2003 April 2004 is 0.606.
- A4.5 However, due to the lack of comparable data for FRIACO EPCs in the network BH in 2001/02, it is not possible to model the effect of the rise of FRIACO EPCs in the network BH in 2001/02 together with the relative slowdown in 2002/03.
- A4.6 Nevertheless, data on FRIACO EPCs in the *FRIACO BH* is available from April 2001. Since the pattern of FRIACO EPCs in the network BH mirrors that in the FRIACO BH (see Figure 4), using the same pattern to adjust the prediction of future values of FRIACO EPCs in the network BH seems a reasonable way forward.

Adjustment

- A4.7 Therefore, a separate regression was run using the same form of the equation, with data on FRIACO EPCs in the FRIACO BH from April 2001 to October 2003.
- This regression produced an R^2 of 0.73 and a standard error of 0.03.
- A4.8 Using coefficients estimated from this regression, future monthly EPCs in the FRIACO BH were derived. This month-on-month increase ratio was then applied to the monthly forecast FRIACO EPCs in the network BH calculated in paragraph 4 above.
- A4.9 This adjusts the forecast EPCs to a slightly lower level, thereby allowing for the effect of the slowdown in the rate of increase in FRIACO EPCs in the network BH.
- A4.10 The average of the historical FRIACO EPCs (May 2003-October 2003) and the forecast FRIACO EPCs (November 2003 April 2003) in the network BH is 0.604.

Annex 5 BT's FRIACO SMP Condition

Condition AA12

Requirement to provide FRIACO

- **AA12.1** The Dominant Provider shall provide either DLE FRIACO or ST FRIACO or both as soon as it is reasonably practicable to every Third Party who reasonably requests it in writing.
- AA12.2 Without prejudice to paragraph AA12.3 below and where a request is covered by paragraph AA12.1 above, the Dominant Provider shall provide DLE FRIACO or ST FRIACO or both on fair and reasonable terms, conditions and charges and on such terms, conditions and charges as the Director may from time to time direct.
- **AA12.3** The Dominant Provider shall ensure that the provision of DLE FRIACO, or where indicated below of ST FRIACO or both covered by paragraph AA12.1 above, includes the following terms:
 - the Third Party shall not be required to account for the volume of internet traffic passing through the Point of Connection, whether by reference to call minutes or otherwise (this requirement applies to both DLE FRIACO and ST FRIACO);
 - (b) the Dominant Provider shall provide a Point of Connection upon the Third Party's reasonable request at any DLE ;
 - (c) for providing DLE FRIACO, the Third Party shall only pay the Dominant Provider a charge (the "DLE Charge") determined according to the following formula:

[D(i) x AR (DLE) (LECO)] + D (ii) + D (iii)

where:

- "AR (DLE) (LECO)" means the Adjustment Ratio (Local Exchange call origination (LECO)) which measures the number of LECO circuits that are needed for each FRIACO port at the DLE. The AR (DLE) (LECO) Adjustment Ratio is 1.78.
- "D (i)" means the charge for the LECO circuit as referred to in Condition AA4.1(f)(i).
- "D (ii)" means the charge for the FRIACO port at the Local Exchange as referred to in Condition AA4.1(f)(ii).
- "D (iii)" means the charge for PPP per FRIACO port as referred to in Condition AA4.1(f)(iii).

(d) for providing ST FRIACO, the Third Party shall only pay the Dominant Provider a charge (the "ST Charge") determined according to the following formula:

[D (i) x AR (ST) (LECO)] + [(D (ii) + F (i)) x AR (LT)] + D (iii) + F (ii)

where:

- "AR (ST) (LECO)" means the Adjustment Ratio (Local Exchange call origination (LECO)) which measures the number of LECO circuits that are needed for each FRIACO port at the Tandem Exchange. The Adjustment Ratio for AR (ST) (LECO) is 2; and,
- "AR (LT)" means the Adjustment Ratio (local tandem (LT)) which measures the number LT circuits that are needed for each FRIACO port at the Tandem Exchange. The Adjustment Ratio for AR (LT) is 1.19.
- "D (i)" means the charge for the LECO circuit (excluding the FRIACO port at the Local Exchange) as referred to in Condition AA4.1(f)(i).
- "D (ii)" means the charge for the FRIACO port at the Local Exchange as referred to in Condition AA4.1(f)(ii).
- "D (iii)" means the charge for PPP per FRIACO port as referred to in Condition AA4.1(f)(iii).
- "F (i)" means the charge for a flat rate internet access local tandem circuit (excluding FRIACO port at the Tandem Exchange) as referred to in Condition AA4.1(g)(i); and
- "F (ii)" means the charge for a FRIACO port at the Tandem Exchange as referred to in Condition AA4.1(g)(ii).
- (e) payment by the Third Party of the DLE Charge or ST Charge or both shall be equivalent to the Dominant Provider's payment terms for corresponding metered interconnection services and shall be payable in arrears. In addition, the Dominant Provider may also offer the Third Party alternative payment terms which are not payable in arrears where such terms are equivalent to the Dominant Provider's payment terms for corresponding metered interconnection services; and
- (f) where any Point of Connection is made available for the purposes of providing DLE FRIACO or, as the case may be, ST FRIACO for less than a whole year, the DLE Charge or, as the case may be, the ST Charge shall be reduced proportionately.
- **AA12.4** The Dominant Provider shall comply with any direction the Director may make from time to time under this Condition AA12.
- **AA12.5** This Condition AA12 is without prejudice to the generality of the provisions in Conditions AA1(a) to AA7 above.

Annex 6 Glossary

AR (Adjustment Ratio): A ratio used to determine the average number of LECO circuits required per FRIACO port.

DLE (Digital Local Exchange): The telephone exchange to which customers are connected, usually via a local concentrator.

EPC (Erlang Per Circuit): Erlang is the unit of traffic volume corresponding to the number of simultaneous calls in progress at any given time or averaged over a period of time. The ratio of the traffic volume over a circuit is the Erlang per Circuit.

FRIACO: Flat Rate Internet Access Call Origination

GoS (Grade of Service): Measures the probability that a call will be unable to be established during the busy hour due to insufficient capacity being available

LECO (Local Exchange Call Origination): The exchange from which a customer's call is originated.

NCC (Network Charge Control): A RPI-X control on the prices that BT can charge for regulated wholesale services

PPP: Product management, Policy and Planning

Tandem Switch: Main exchange in the core network which acts as switching points for calls.