

TATT 4/7/06/1

In the matter of arbitration

Telecommunications Authority of Trinidad and Tobago

Section 82, Telecommunications Act

Between:

Digicel (Trinidad and Tobago) Limited (“Digicel”)

Claimant

v.

Telecommunications Services of Trinidad and Tobago Limited (“TSTT”)

Respondent

Decision No. 2/2006

16 August 2006

Table of Contents

1.	PROCEDURAL HISTORY	3
2.	BASIS OF CHARGES	7
2.1	Digicel's request	7
2.2	Is reciprocal charging required, and if not, is it necessarily impermissible?	11
2.3	Establishing the costs of an efficient operator in Trinidad and Tobago	30
2.4	Are the operators providing the same service under similar conditions?	53
2.5	Would reciprocal charging in the initial period of liberalisation frustrate the purposes of the Act?	57
2.6	The retail market and non-discrimination	74
2.7	Conclusion	79
3.	INTERIM INTERCONNECTION CHARGES	80
4.	ACCESS DEFICIT CHARGES	83
4.1	Digicel's request	83
4.2	The arguments of the parties	84
4.3	Must ADCs be ruled out of the Interconnection Agreement?	86
4.4	Conclusion	91
5.	OTHER SERVICES	92
5.1	Are the services subject to interconnection obligations?	92
5.2	Should the services be included in the Interconnection Agreement?	98
6.	SMS CHARGES	107
7.	ADVANCE PROVISION OF WHOLESALE SERVICES UNDERLYING NEW RETAIL SERVICES	109
8.	DIVERSITY OF FIBRE	116
9.	RECOMMENDATIONS TO THE AUTHORITY	119

1. PROCEDURAL HISTORY

The arbitration arises out of negotiations between TSTT and Digicel regarding the agreement for the interconnection of their networks and services (the “Interconnection Agreement”). Several issues have been raised, including whether the Interconnection Agreement is to provide that the interconnection charges of the parties shall be reciprocal, whether it is to refer to possible access deficit charges, and various other matters.

The proceeding was initiated by Digicel by Notice of Dispute on 19 January 2006 under the Procedures for the Resolution of Disputes in the Telecommunications and Broadcasting Sectors of Trinidad and Tobago (the “Dispute Procedures”) issued by the Telecommunications Authority of Trinidad and Tobago (the “Authority”). On 20 January 2006, the Authority issued a Confirmation of Dispute under the Dispute Procedures. Digicel on 27 January 2006 served a Complaint on TSTT (the “Complaint”) setting out the subject matters of its complaint, and attaching the draft Interconnection Agreement then under negotiation. TSTT filed a Response on 10 February 2006 (the “Response”), responding to the matters set forth in Digicel’s Complaint. Digicel filed a Reply on 20 February 2006 (the “Reply”).

The Authority issued a Notice of Hearing dated 1 March 2006 and a preliminary hearing was held with the parties and the Authority on 9 March 2006. Pursuant to that hearing, the panel was engaged by the Authority by letter from the Authority on 14 March 2006, and was issued the terms of reference for this arbitration, including the List of Issues agreed by the parties, together with the Complaint, the Reply and the Response (the “Terms of

Reference”). The Authority issued an Order on 15 March 2006 formally appointing the panel, referring the dispute to arbitration, and attaching the List of Issues.

The panel held a procedural hearing with the parties on 31 March 2006 in Port of Spain, at which Digicel also brought an application for setting interim interconnection rates, detailed further in section 3 of this decision. The panel issued Procedural Directions No.1 on 8 April 2006, which it subsequently amended on 2, 12 and 15 May 2006.

The parties exchanged pleadings, witness statements and expert witness statements, as well as reply witness statements and reply expert witness statements. The parties filed pre-hearing submissions on 20 May 2006. The evidentiary hearing was held in Port of Spain, beginning on 23 May 2006 and concluding on 26 May 2006.

The parties submitted certain cost information to the panel during the evidentiary hearing. The panel subsequently engaged a neutral expert, TERA Consulting, a French consulting firm (the “Panel Expert”) to assist in reviewing the cost information submitted by the parties. The panel selected the Panel Expert after considering submissions of the parties regarding a shortlist of three candidate consulting firms identified by the panel.

At the panel's direction, the parties negotiated terms of reference for the Panel Expert. Where the parties did not agree on the Panel Expert's terms of reference, the panel determined those terms, as well as adding some additional terms. The panel issued the terms of reference for the Panel Expert on 12 June 2006 and amended them on 21 June 2006. The Panel Expert's terms of reference reflected the agreement of the parties that neither would have sight of the other's confidential cost model information. Any

questions from and answers to the Panel Expert regarding a party's cost model would be disclosed to the other party, but the concerned party could redact confidential information from such questions and answers. Only the panel and Panel Expert would have the unredacted, confidential versions. The parties also agreed that the Panel Expert would prepare two forms of report: an abridged version for the parties excluding confidential information, and an unabridged version for the panel. This process was followed.

On 14 June 2006, the panel applied under section 2.10.19 of the Dispute Procedures to the Board of the Authority for an extension of the deadline for the panel's decision due to additional evidence submitted by the parties.

The parties filed closing submissions and reply submissions on 28 June 2006 and 3 July 2006, respectively.

The Panel Expert provided their report on 14 July 2006. A further evidentiary hearing was held by telephone conference on 19 July 2006. The parties filed supplemental submissions on 24 July 2006. The panel requested submissions from the parties on 8 August 2006 which were provided on 9 August 2006. The panel applied on 10 August 2006 to the Board of the Authority for a further extension to today's date.

The Authority has certain powers under the Telecommunications Act of 2001, as amended in 2004 (the "Telecommunications Act") in relation to interconnection agreements, and under the Concessions, the Authority may require a concessionaire to prepare a Reference Interconnection Offer ("RIO"). The parties' pleadings referred sometimes to TSTT's RIO, and sometimes to the Interconnection Agreement. For practical purposes, the two may have become intertwined in the parties' negotiations, but they are conceptually and legally different documents. The matter properly before the

panel is the dispute between the parties regarding their failure to enter into the Interconnection Agreement and not the Authority's position on TSTT's RIO.

2. BASIS OF CHARGES

2.1 Digicel's request

TSTT proposed that the Interconnection Agreement include the following clauses and Digicel opposed their inclusion:

9.2 [text omitted intentionally] Unless otherwise stated, Charges payable by TSTT to [Digicel] for a Service shall be the same as the Charges payable by [Digicel] to TSTT for the same Service. In the event that TSTT's Charges for a Service are varied pursuant to Clause 10, [Digicel] will vary its Charges for the same Service to ensure they remain the same. [text omitted intentionally]

9.3 The Parties acknowledge that Charges for the mobile termination part of the PLMN Terminating Access Service specified in the Tariff Schedule are reciprocal.

It is clear from the evidence of both parties that a significant factor in their negotiation has been their interconnection charges, most particularly charges for termination of calls on their mobile networks. Each party proposes that its mobile termination charge be based on its cost model. According to Digicel's cost model, its per minute costs for termination of calls on its network are TT\$1.15 (US 18.3 cents). According to TSTT's cost model, TSTT's termination costs are TT\$0.45 (US 7.2 cents). To put these in perspective, TSTT estimates its unit cost at 39% of the amount Digicel estimates as its unit

cost. Otherwise put, Digicel estimates its unit cost as being 156% over and above TSTT's estimate of its own unit cost.

TSTT proposed that the parties should have the same, reciprocal charge, and that it should be based on the results of TSTT's cost model. Lest there be any confusion, references to "reciprocal" in this decision means the provision of a given service from each party to the other at the same price. The parties did not make the distinction used in some jurisdictions between "reciprocal", meaning each party must pay the other party, and "symmetrical", meaning the price each must pay must be the same.

Digicel argued that requiring reciprocal charging would be contrary to the Telecommunications Act and the Concessions of each party, each dated 31 December 2005 (the "Concessions"). Digicel's position was that the Telecommunications Act and Concessions require charges to be based on its own costs, which are likely to be, and in Digicel's submission indeed are, different. Since the parties' costs may differ, the charges may differ. Only if the parties' interconnection costs were the same could their interconnection charges be expected to be the same.

Termination costs and charges based on such costs are set in relation to volumes of minute units of usage. Digicel argued that TSTT enjoys substantial economies of scale in relation to usage, i.e., volumes of call traffic. Digicel argued that as a new entrant, until the market reaches a steady state and so long as it does not have the usage volumes at the level of its network capacity, it would suffer losses if it used TSTT's proposed charge.

Furthermore, TSTT will enjoy lower per unit costs as an incumbent and, prior to the market reaching a steady state, will make "supernormal profits" on mobile termination at its proposed charge. Digicel provided evidence

regarding its own cost model, and submitted various benchmark data and other arguments in support of its position.

According to Digicel, its submissions show what Digicel's level of costs are and that Digicel's costs are indeed very different from TSTT's alleged costs. Further, they show that TSTT's proposed charge is lower than the cost of mobile termination in Trinidad and Tobago – and indeed must be lower than TSTT's actual costs. In all, Digicel submitted these are reasons why a requirement for reciprocal pricing would ignore the fundamental economic realities of interconnection in the Trinidad and Tobago market.

Digicel also argued that TSTT's proposed mobile termination charge is unusually low by international benchmarks. It claims that the combination of TSTT's insistence on reciprocal charging and the level of TSTT's proposed charge is part of an anti-competitive strategy by TSTT. If Digicel had to charge this rate, which Digicel submitted is below its cost, instead of its own proposed rate, Digicel would suffer a loss. TSTT on the other hand is an integrated fixed and mobile operator. Thus if TSTT suffers a loss on mobile termination for the same reason, the loss will be made up by the saving TSTT's fixed division enjoys by paying the lower termination rate to TSTT's mobile division for fixed-to-mobile calls. The overall effect would be to starve Digicel of revenue and cash flows which it needs at this expensive time of market entry, and put TSTT in funds to strengthen its competitive position against Digicel. The charge proposed by TSTT, if applied reciprocally, would therefore have a damaging effect on competition in Trinidad and Tobago. Reciprocal charging would therefore frustrate a key goal of the Telecommunications Act.

TSTT argued that the requirement of the Telecommunications Act and Concessions that interconnection charges be based on costs must be read

in the context of the statutory and policy framework of the Act. According to TSTT, this framework is consistent with the principle of economic efficiency. Economic efficiency in mobile termination is accomplished if the charges are regulated to ensure they reflect the costs of an efficient operator. The principle of economic efficiency would assume costs of a single typical, efficient operator, i.e., a standard for efficient operation in a geographic market. Thus a single, efficient charge is appropriate for mobile termination, and so charges should be reciprocal.

TSTT responded to Digicel's arguments regarding the different costs of the parties' networks, submitting evidence and argument in rejection of Digicel's contention that TSTT's costs are or must be lower than Digicel's – or that TSTT has calculated them below its own actual cost. TSTT argued that the differences of economies of scale to which Digicel refers simply represent the normal challenge that any new entrant faces when entering any market. Differences in the costs of Digicel and TSTT due to economies of scope, if any even exist, are insignificant. TSTT also claimed that Digicel's benchmark data is selective and not relevant to the current context. TSTT did not propose benchmark data as a basis for setting charges. It did, however, draw the panel's attention to alternative benchmark data that supports its position.

Furthermore, TSTT submitted that its cost model has been designed to calculate mobile termination costs of an efficient mobile operator in Trinidad and Tobago. In TSTT's submission, this cost model provides the only reliable such calculation. Since there are no legitimate reasons for Digicel's costs to be different from the costs of an efficient mobile operator, the costs resulting from TSTT's model should be the basis of a reciprocal charge for mobile termination services.

TSTT also brought various arguments as to why non-reciprocal charges, particularly permitting Digicel to use Digicel's proposed charge, would harm competition and efficiency in Trinidad and Tobago. In particular, allowing Digicel to charge the rates it had proposed would require TSTT to increase its retail tariffs for calls from fixed line customers to Digicel customers. Non-reciprocal rates would also be discriminatory, which would be contrary to the Act and Concessions.

2.2 Is reciprocal charging required, and if not, is it necessarily impermissible?

(a) The parties' arguments

Both parties referred to section 25(2)(m) of the Telecommunications Act which requires the Authority to require Concessionaires to:

...disaggregate the network and on a cost basis, in such manner as the Authority may prescribe, establish prices for its individual elements and offer the elements at the established prices to other concessionaires of public telecommunications networks and public telecommunications services.

The parties also referred to section 14 of the Interconnection Guidelines issued by the Authority. These are mirrored in Schedule H of the Concessions of both TSTT and Digicel. Section 14 provides:

(1) All interconnection charges shall be based on costs determined in accordance with such costing methodologies as the Authority shall from time to time

specify, which may include termination rates or any other metric of costs agreed between concessionaires;

(2) Where the relevant data for the application of the costing methodologies are unavailable within a reasonable time period, interconnection charges may be set with reference to benchmarks based on costs as determined by the Authority.

On 9 May 2006, the Telecommunications (Interconnection) Regulations 2006 (the “Interconnection Regulations”) were published in the gazette – after the Concessions had been signed and the Interconnection Guidelines issued, and after this proceeding was well underway. The Interconnection Regulations have clearly been developed from Schedule H in the Concessions and provide in section 15 that:

(1) A concessionaire shall set interconnection rates based on costs determined in accordance with such costing methodologies, models or formulae as the Authority may, from time to time, establish.

(2) Where the relevant data for the establishment of the costing methodologies, models or formulae are unavailable within a reasonable time, the concessionaire may set interconnection rates with reference to such costing benchmarks, as determined by the Authority, that comport with internationally accepted standards for such benchmarks.

The parties' arguments relied upon the terms of the Concessions and Interconnection Guidelines and did not refer to the Interconnection Regulations. Having considered the evidence and the parties' arguments in light of the Interconnection Regulations, the panel concludes that the differences between Section 14 of Schedule H of the Concessions and section 15 of the Interconnection Regulations would not alter the panel's findings in any material respect. The differences do not reduce the emphasis on cost-based charging or the role of methodologies established by the Authority. The Interconnection Regulations may alter the standard for using benchmarks but, as will be seen later in this decision, the panel considers careful selection of benchmarks to be appropriate in any event. For this reason, and to avoid unnecessary repetition, references to the Concessions in this decision may be taken (except as otherwise indicated) as including reference to the Interconnection Regulations as well as the Interconnection Guidelines.

Digicel submitted that section 25(2) of the Act must be understood as mandating each operator that terminates traffic to its subscribers from another operator:

- (i) to disaggregate *its own* network into its individual elements,
- (ii) to establish charges for those individual elements of *its own* network required for terminating traffic on a cost basis; and
- (iii) to offer such individual elements of *its own* network to the originating operator at such established charges.

Digicel's argument appears to be that "its individual elements" in section 25(2)(m) must be construed as referring to the specific identity of the elements

whose costs alone must be used to establish that concessionaire's charges.

Digicel argued that this is reflected in the manner in which each party had in fact prepared its own cost model. Digicel referred to evidence of TSTT's costing specialist, Ms. Neil, and Digicel's expert witness, Mr. Grummit of Analysys, to the effect that each company had prepared its own cost model by disaggregating its own network elements, allocating a unit cost to each element, and allocating costs of each element in relation to its usage for the relevant service. (In TSTT's case, its cost model was adjusted in respect of mobile services, as discussed later.)

Digicel concluded, therefore, that when the elements of each terminating operator's network used to receive, convey and deliver signals from the originating operator's network to the terminating network's subscriber have different costs, then the charge for unbundling those elements ought not to be the same. Except if the costs happen to coincide, the principle of cost-based charging is inherently inconsistent with the principle of reciprocal charging proposed by TSTT in the interconnection agreement.

TSTT argued that the economic and policy principles to be applied in the liberalisation of the market, including interconnection charging, were reflected in the policy and statutory framework of the Act, including the Act's objectives. These must inform the interpretation of section 25(2)(m) of the Act and the Concessions. Parliament, in TSTT's submission, intended regulation needed to facilitate competition in the telecommunications industry to be consistent with the principles of economic efficiency that inform modern telecommunications regulatory regimes. Competition policies based on economic efficiency ensure that the interests of the public are paramount by forcing operators to "flow through" the benefits of their relative efficiencies to

users in the way of lower prices.

TSTT cited Digicel's expert witness, Mr. Gunnigan, who – consistent with TSTT's expert consultants NERA and the Panel Expert – stated in his report and confirmed on cross-examination that the objective underpinning cost-based interconnection is to promote economic efficiency (Day 1, page 124).

TSTT referred also to the report of the European Independent Regulators Group, dated 1 April 2004, "Principles of Implementation and Best practice on the application of remedies in the mobile voice call termination market" (the "IRG Report"). The IRG Report stated that regulation of mobile termination charges was required to address the problem of charges which exceed the charges of an efficient effectively competitive wholesale mobile termination market. According to the IRG Report, in such a market, excessive margins would be competed away and prices driven down to the efficient level of cost plus a sustainable margin. In TSTT's submission, then, "cost-based" is synonymous with economic efficiency. Furthermore, it argued, the principle of economic efficiency assumes the existence of a typical, efficient operator. There could be only one measure of such an operator's mobile termination costs. Hence charges should be reciprocal.

TSTT also submitted that the Authority had already published unambiguously its position that charges should be reciprocal in the public consultation on the preparation of the Interconnection Regulations.

(b) The Authority has not established an authoritative position on reciprocal charging

In the panel's opinion, the Authority clearly has a determinative role in how interconnection costs and charges are established under section 25(2)(m)

of the Act and section 14 of Schedule H to the Concessions. Therefore, the panel looks first to any decisions by the Authority establishing its position on reciprocal charging.

During 2005, the Authority held a consultation regarding Interconnection Regulations and an Interconnection and Access Policy. The Authority's Recommendations regarding each of these are dated 23 September 2005. The Authority has also published an Indicative Specimen Reference Interconnection Offer.

The Recommendations for Interconnection Regulations are available on the Authority's website. These attach at the back a document entitled "Interconnection Regulations Version 2 – Decisions on Recommendations". TSTT contends that statements in this attachment express the Authority's unambiguous position on reciprocal charging.

The "Decisions on Recommendations" attachment appears to record the consultation process. It sets out columns identifying sections of an earlier draft of the Interconnection Regulations, identifies those stakeholders which made submissions, describes the comments received from and recommendations made by them, and lastly includes a column titled "TATT's decisions". On pages 47 and 50, TSTT is recorded as having requested clearer direction on costing methodologies used to set prices for interconnection services, and recommended that interconnection charges be reciprocal for the same service. Opposite this in the "TATT's Decisions" column on page 47, is the entry: "TATT agrees that charges should be reciprocal between concessionaires. This will be implemented." In the same column opposite TSTT's similar comments on page 50, it says, "TATT agrees. The Regulations will be amended accordingly."

However, the recommended Interconnection Regulations proposed by the Authority as a result of the consultation described in the “Decisions on Recommendations” document (and to which it is attached) did not refer to reciprocal charging. Nor did any reference to or decision regarding reciprocal charging appear in the final Interconnection Regulations when adopted on 9 May 2006. Furthermore, the “Decisions on Recommendations” attachment has a ring of informality about it, recording a process in short-hand rather than issuing final decisions on major policy matters. Since the notion of reciprocal charging did not make an appearance in the Interconnection Regulations resulting from the consultation process, the Authority must be taken to have deferred the issue.

In the panel’s opinion, the statements in the “Decisions on Recommendations” document to which TSTT refers cannot reasonably be relied upon as a developed, much less an authoritative position of the Authority, particularly not on a matter of this importance.

Two other documents of the Authority offer insight into the question whether it has expressed an official position or specified a methodology that may relate to the issue of reciprocal charging.

First, the Authority’s recommended Interconnection and Access Policy, also on the Authority’s website, includes a section on Pricing Interconnection Services. It is silent on the notion of reciprocal charging, although it emphasizes setting charges to reflect efficient costs and introduces the idea of the Authority approving a standard cost model. The rest of the document repeatedly refers to efficiency as a central policy aim of the Interconnection and Access Policy.

Secondly, a review of the Authority's Indicative Specimen Reference Interconnect Offer, also on the Authority's website, shows that it does not refer to reciprocal charging either. It does repeatedly, however, reflect the objective of achieving efficiency. It also suggests the possibility of adjustment due to "diseconomies of scale" (including in "emerging stages") in describing the "Economic Concept" in its Section 2. The Indicative Specimen Reference Interconnect Offer is referred to by the Authority on its website as "preliminary" and providing "guidelines", and the document itself is titled as "Indicative". The document appears to address only interconnection providers having 40% of the subscribers in the market where an interconnecting concessionaire is seeking entry. The terms of the cost-based requirements in both parties' Concessions are identical, however. The panel derived little guidance from this document in this context.

The panel concludes that any deliberations or statements of the Authority on the matter of reciprocal charging have been at the most preliminary and certainly inconclusive. Thus reciprocal charging is neither expressly required nor expressly prohibited by the applicable statutes and regulations. It falls to the panel acting under the Authority's dispute resolution mandate in section 82 of the Telecommunications Act to address this issue for the first time in respect of the Interconnection Agreement between TSTT and Digicel.

(c) The statutory and policy framework

As acknowledged by both parties, this dispute takes place in the context of the process of liberalisation under the Telecommunications Act.

The Telecommunications Act clearly expresses the intention, and is designed, to generate competition. In addition, the Act sets out how regulation should

address situations where notwithstanding the liberalisation of the market there remain areas where competition is not yet present or effective.

The Preamble introduces the Act in the context of establishing:

... a comprehensive and modern legal framework for an open telecommunications sector by permitting new providers of telecommunications services to enter the market and compete fairly...

The Preamble also introduces the Authority's role as being:

... to guide the sector's transformation from virtual monopoly, in which Telecommunications Services of Trinidad and Tobago is the principal provider of telecommunications services, to a competitive environment, to monitor and regulate the sector so transformed and, in particular, to prevent anti-competitive practices...

The first objective mentioned in section 3 of the Act is establishing conditions for "an open market for telecommunications services, including conditions for fair competition..." This is consistent with the provisions in section 21 for granting concessions to introduce new operators, and the extensive and detailed provisions in section 25 providing for the establishment of interconnection. The parties' submissions, the Interconnection Regulations and the Authority's proposed Interconnection and Access Policy all reflect the position that interconnection is a key enabler of competition.

The Act not only provides for enabling competition, but for the fact that, notwithstanding the introduction of competition to parts of the market, it will not become fully competitive overnight. Some segments may lack competitive effects for considerable time to come due to historical or economic reasons. The Act provides for situations where a lack of competition or unfair behaviour may frustrate its overall purposes. With respect to price regulation, for example, the Act prohibits anti-competitive pricing in section 22, and sets out the Authority's price regulation role in section 29. An interplay between the Authority's price regulation role and the level of competitiveness of the market is envisaged throughout section 29. This is most clear when it comes to determining an operator's "dominance", where the Authority is required to take into account various factors relating to the structure and functioning of the market (section 29(8)).

With respect to interconnection charges, however, the Telecommunications Act's guidance on charging for disaggregation by operators of their networks and offering of their elements to other operators simply provides that this must be "on a cost basis in such a manner as the Authority may prescribe" (section 25(2)(m)). This is elaborated further in section 14 of Schedule H to the Concessions, which clearly emphasizes setting interconnection charges based on costs – whether pursuant to methodologies prescribed by the Authority or derived from benchmarks based on costs.

In the panel's view, this emphasis on and approach to regulating charging for interconnection based on costs must be understood in light of the structure and functioning of the interconnection market, and in this case the mobile termination market.

Documents submitted or referred to by the parties and their expert witnesses offer consistent observations and conclusions concerning the mobile

termination market. We refer to: the IRG Report referred to by TSTT; the 2003 report of the UK Competition Commission, “Vodafone, O₂, Orange and T-Mobile”, referred to by DotEcon; and the reports of the New Zealand Commerce Commission (“NZCC”) in its “Investigation into Regulation of Mobile Termination”, referred to by NERA.

In summary, in the context of calling-party-pays (CPP) regimes, such as currently obtains in Trinidad and Tobago, the terminating mobile operator has an effective monopoly over the market in termination of calls to its subscribers. Put simply, calls terminating to a mobile operator’s subscriber must be terminated by that operator. Reaching that subscriber through his or her fixed line phone is not an effective substitute since the fixed line lacks the key element of mobility of the mobile phone. Widespread holding of two mobile phones may alleviate this to some degree indirectly, but the party receiving the call does not pay for the call’s termination, and so has much less interest in its cost than the calling party. The party making the decision to use the overall service (i.e., the calling party) is often ignorant of, or at least has no control over, the choice and charge of the operator providing the termination element of the service.

In the case before the panel, then, we are faced with two operators each negotiating the price at which it will provide a service over which it has an effective monopoly. Of course, until it can interconnect with the incumbent, the new entrant cannot provide any termination services on a commercially viable basis and so exercise this monopoly power, but other than this there is little competitive pressure on its charges.

Considering mobile termination as a monopoly market, the panel interprets the approach to cost-based charging in the Act and the Concessions as originating from the expectation that there is likely to be such a lack of

competitive effects on interconnection charges that it is necessary to mandate by law and regulation that they be based on costs, set pursuant to methodologies prescribed by the regulator. Indeed, unlike the approach to price regulation in section 29 of the Act, there is no reference to “dominance” when it comes to interconnection, presumably because both operators are expected to be effectively dominant in the termination market. Thus, both the incumbent TSTT’s Concession and the Concessions of the new entrants including Digicel contain the same section 14. The panel does not discount the possibility that a competitive wholesale market in interconnection may develop over time as new wholesalers enter the market. This may in time permit the manner in which interconnection charges are set to take into account the presence of competitive effects that go some way towards achieving the statutory requirement.

In the panel’s opinion, the common theme underlying both the emphasis in the Act and Concessions on encouraging competition and the requirement of cost-based interconnection charging is to be found in the economic principle of efficiency. On the one hand, competition can be expected to promote economic efficiency as competitive forces lead operators towards more efficient choices of technology, deployment of infrastructure and operation. In a competitive environment, prices come under downward pressure, converging in the direction of costs as competitors pass relative efficiency gains through to customers for whom they are competing. And on the other hand, where competition cannot be relied upon to deliver such efficiency gains, such as in the interconnection market, the Act and Concessions cut directly to the point and provide for interconnection charges to be cost-based.

Cost-based charging for interconnection in the statutory and regulatory framework, then, is meaningfully construed in terms of promoting economic efficiency. This is consistent with the emphasis on economic efficiency in

the Interconnection and Access Policy which the Authority has proposed for adoption. It is also consistent with the evidence of the expert witnesses as referred to above. The manner of determining costs to establish interconnection charges must lead with this principle.

There are numerous ways of determining costs, and these are complicated by the capital intensity of the business, particularly when it comes to ways of calculating costs on an annual basis or averaging them over a selected period. Moreover, as is clear from the submissions of both parties and the Panel Expert, there are numerous methodologies for determining efficient costs for the purposes of setting interconnection charges. These include variations on long run incremental costs (“LRIC”), total element long run incremental costs (“TELRIC”), fully distributed costs (“FDC”) and variations depending on whether the approach is “bottom up” or “cost down”. To a significant degree, as will be seen later, various methodologies do not calculate an operator’s actual costs but make certain assumptions that construct a hypothetical cost intended to reflect the relevant statutory and policy framework.

Each of the possible methodologies may have different implications for the structure and regulation of the market. It is for this reason, in the panel’s view, that section 25(2)(m) of the Act refers to the establishment of prices on a cost basis “in such manner as the Authority may prescribe”, and section 14 of Schedule H to the Concessions refers to the determination of costs “in accordance with such methodologies as the Authority shall from time to time specify.” The Act delegates power to, and relies upon the wisdom of, the regulator to prescribe methodologies that will correctly apply the goals of the Act.

To construe the Act and Concessions as referring only to each individual operator's own costs alone to determine that operator's charges would distract from the underlying principle to be applied in the methodologies the Authority may specify. In the panel's view this underlying principle is the promotion of economic efficiency.

The panel therefore disagrees with Digicel that the Telecommunications Act and Concessions necessarily require an operator's charges to be based only upon the cost of that operator's network elements. In the very least, an operator's alleged costs according to its calculations must be considered in relation to whether they are efficient, for example by evaluation of whether its cost model is organized to calculate efficient costs, or by comparison of its assumptions, mechanisms and results against a cost model designed to provide the costs of an efficient operator. This appears to be the purpose behind the proposal in the Authority's recommended draft Interconnection and Access Policy that it develop a standard cost model for the sector – to provide a benchmark of a typical cost against which operators' own cost models could be evaluated.

The Panel Expert gave evidence regarding the concept of economic efficiency. From an economic point of view, efficiency involves two aspects: "dynamic efficiency" and "static efficiency". An operator was dynamically efficient if it switched from one technology to another at an appropriate time in order to use the best available technology. Static efficiency is determined by the average unit cost as a function of the production volume. Static efficiency is achieved when a company is able to produce at the lowest average unitary cost. Thus, for a mobile operator, it is reached when its volume of traffic reaches the full capacity of its network at a given quality of service. If the volumes exceed the network's capacity, it becomes necessary to invest in the network to increase its capacity, moving the network into a new investment

stage. It may not be possible to compare operators at different stages of investment because even if both are operating at full capacity, one's network may permit a higher volume of traffic than the other's. So, both may operate at capacity yet have different unitary costs. As the Panel Expert stated, "...we cannot speak of 'the' efficiency but of 'an' efficiency which depends on the number of produced units AND stage of investment." The parties did not quarrel with this understanding of efficiency and the panel accepts it.

The panel recalls its earlier conclusion that the Act's interconnection provisions are largely intended to address an expected lack of competitive conditions in the market for interconnection services. Were there a fully competitive market in termination services, an increasingly narrow range of efficient charges for interconnection could be expected to result. In such a market, as acknowledged by Mr. Gunnigan under cross-examination, competitive pressure would not permit operators to charge at higher rates due to higher costs according to their accounting or cost modelling (Day 1, page 138).

The panel agrees with TSTT that in a competitive market among operators offering the same service under similar conditions, prices can be expected to converge towards a common level bearing relation to the costs of increasingly efficient operators. Real life suggests that such convergence may not result in a single, perfect price, but a range. Nevertheless, in the panel's view, this convergence would correctly be taken into account in prescribing the manner of establishing interconnection charges, and in specifying costing methodologies.

It would also be relevant to take into account the nature of long run cost modelling in specifying costing methodologies. According to the evidence before the panel, LRIC and TELRIC models involve constructing a

hypothetical, cost based on assumptions, for example about operating at network capacity. These assumptions may not prove to be correct predictions, and indeed they may never be expected to be fulfilled. They are a mechanism for leading the cost model result towards efficiency. Such a cost model does not pretend to produce the actual costs of an individual operator, but the costs of a hypothetical operator operating at static efficiency. Optimal efficiency can be expected to be achieved when the market is at its most competitive and so in furtherance of the principle of economic efficiency, it is reasonable to apply a cost model assuming the market has reached a steady and competitive state. The results can reasonably be referred to as those of a typical, efficient operator. Such results used in a regulatory context can reasonably serve as a means for the regulator to promote efficiency – whether to keep already efficient operators at that level, or to encourage others to strive for it.

For these reasons, the panel finds that it would not be unreasonable, indeed it may often be eminently reasonable, for administrative purposes in a regulatory context to mandate a single, reciprocal charge for a given service for all operators which are providing the same service under similar conditions if that charge was reasonably believed to be based on costs of a typical, efficient operator. The panel finds that it would also not be unreasonable for an interconnection agreement between operators acting under similar conditions to require each operator to charge the same rate so long as it was indeed a charge based on the costs of an efficient operator. The argument raised by Digicel that it is operating under conditions so different from TSTT that TSTT's charge (whether viewed as based on TSTT's actual costs or the costs of a hypothetical, typical operator) cannot be used for Digicel is discussed later.

Noting the Panel Expert's evidence that a high production volume will provide a lower per unit cost, the panel considers that it would be unreasonable to permit the cost of just any operator which happened to be efficient to be mandated automatically as reciprocal for all other operators. It would be appropriate to consider whether the production volume – minutes of traffic – used in the proposed operator's cost model reflects a reasonable steady state in the evolution of the market and not an excessively low or high volume due to its market position.

Such an operator might be viewed as a typical, efficient mobile operator, and its costs could be required reciprocally. So, for example, the UK Competition Commission in its review of mobile termination referred to by Digicel took the level of respective market shares of the operators into account in selecting a model efficient operator mobile termination rate. The UK mobile market was much closer to a "steady state" than the market is today in Trinidad and Tobago, making the UK exercise a simpler one with less considerations than face us here.

The panel also considers that there are various benefits, not insignificant, that may be anticipated from reciprocal charging. It puts the operators in a position of parity regarding the revenues they can earn from the traffic their subscribers generate on their networks as recipients of calls. Reciprocal charging can simplify the process of regulation, since modelling the interconnection costs of every individual concessionaire in Trinidad and Tobago can be expected to consume extensive regulatory resources in the years to come. Reciprocal charging also reduces the number of charges being negotiated between operators.

The panel finds that there are, then, good reasons to adopt reciprocal charging, but this is not to say that it may be automatically mandated in all

situations. Nor is it to say that the economic principle of efficiency is necessarily the only or overriding theme of the Telecommunications Act and the only factor to be considered in applying section 25(2)(m) of the Act and section 14 of Schedule H to the Concessions. The principle of economic efficiency must be understood in the context of the preamble and the objectives in section 3 of the Act.

The aim of achieving a “competitive environment” mentioned in the preamble, reflected in references to “variety of telecommunications services” and “promoting access to telecommunications services” in section 3, relies in good part on the establishment – and so viability – of effective facilities-based competitors to drive retail prices down to levels where services are increasingly affordable. The object of the Act in section 3(a) to “establish conditions for an open market for telecommunications services, including conditions for fair competition” includes addressing prevailing conditions that pose structural economic barriers to the development of competition and investment, and the viability of otherwise efficient competitors. The objective in section 3(f) of the Act of “establishing conditions for ... promoting the industry by ... encouraging investment in, and the use of, infrastructure to provide telecommunications services” is more proactive than merely “permitting new providers...to enter the market”.

It is clear to the panel from the parties’ submissions that telecommunications network infrastructure, particularly for a nationwide mobile operator, involves major capital investment and poses significant economic challenges for new entrants. Ensuring that operators really can “enter the market and compete fairly” requires that the playing field be level enough for operators to build a sustainable competitive position in the first place, although not tilted to new operators so as to be unfair to the incumbent. Nothing in the Act suggests that inefficient businesses or technologies are to be supported or

encouraged, which would be unfair to operators in the market which are striving for efficiency.

The “guiding” role of the Authority mentioned in the Act’s preamble and the object of establishing conditions for “facilitation of the orderly development...” in section 3 suggest that careful, intelligent exercise of its functions provided for under the Act is appropriate. The factors above must be weighed when considering how to carry out the Authority’s functions provided for in the Act – including the dispute resolution function in section 82. In the panel’s view, the principle of economic efficiency underlying the regulation of interconnection charging in Trinidad and Tobago must be read with these fuller objects in mind. Rigid adherence to the principle of economic efficiency would be inappropriate if the conditions it would establish would present an insurmountable economic barrier to the development of otherwise viable long term effective competitors.

As discussed above, the Authority has not specified a costing methodology. The panel is acting in the dispute before it under the Authority’s dispute resolution mandate in section 82 of the Telecommunications Act. In this role, the panel, taking into account the considerations above, finds that the Act and Concessions, properly construed, would permit and even promote reciprocal charging in interconnection agreements except in the following three circumstances:

First, an operator should not be permitted to mandate reciprocal charging if the charges are not based on the costs of an efficient operator in a steady state of the market in the first place. If they are too high, they may perpetuate inefficiency; if they are too low, they may have anti-competitive effects, as claimed by Digicel in the case before the panel.

Secondly, even if the charges contemplated by an interconnection agreement are based on efficient costs, it would not be appropriate for an interconnection agreement to require them to be applied reciprocally if the other operator is not providing the same service under similar conditions such that even in a state of static efficiency it cannot reasonably be expected to match the efficient costs of the first. This might be due, for example, to the operators effectively providing different services, or having different frequency spectrum or licence rights.

Thirdly, an interconnection agreement should not mandate reciprocal charging if it would frustrate the objects of the Act as they relate to the development of fair competition and encouragement of investment. In the case before the panel, Digicel's arguments concern its situation as a new entrant facing a market approaching maturity which has been highly penetrated by TSTT.

The remainder of this decision considers these three reasons not to provide for reciprocal charging in the Interconnection Agreement with respect to mobile termination services, since it is with respect to these charges that this dispute has arisen.

2.3 Establishing the costs of an efficient operator in Trinidad and Tobago

(a) Evidence from the parties' cost models

The panel's terms of reference in this dispute did not include the setting of interconnection charges between the parties, except to the extent described in section 3 of this decision. However, the panel considered the evidence of the parties' costs to be relevant in its deliberations as to whether reciprocal

charging should be provided in the Interconnection Agreement.

Digicel submitted evidence from its Senior Economist and Interconnection Specialist, Mr. Barrins, whose testimony was that he had been responsible for preparing Digicel's cost model. Digicel also submitted evidence from Analysys, a consulting firm. Mr. Barrins and Mr. Grummit of Analysys were cross-examined on their evidence. Both referred to Digicel's cost model as a long run incremental cost ("LRIC") model. Analysys had made certain recommendations which had been implemented by Digicel. Analysys' evidence was that it had verified that the cost model's mechanical calculations were in agreement with international principles of cost modelling, including specifically depreciation, cost of capital and allocation of costs. Analysys also expressed the opinion that the model was a suitable tool to provide a reasonable view of the expected average cost of mobile termination over the 2006-2009 period on Digicel's GSM network.

Analysys expressed the caveat that the model, like any forward looking cost model, depended on the accuracy of the costs and traffic forecasts used, which are difficult to forecast accurately. Nevertheless, Analysys viewed Digicel's subscriber and traffic forecasts as reasonable and aligned with experience with similar operators including Digicel in comparable countries. Analysys also stated that Digicel's cost model did not have the same level of complexity as other best-practice mobile LRIC models, although in its view this should not have a material impact on the ability of the model to determine an average unit cost for wholesale termination from fixed and/or mobile networks.

TSTT's Costing Specialist, Ms. Neil, provided evidence regarding TSTT's cost model, as did TSTT's expert NERA. NERA gave evidence that it had reviewed TSTT's cost model at a considerable level of detail and made

recommendations which had been implemented by TSTT. Ms. Neil and NERA consultants Drs. Ros and Tardiff were cross-examined on their evidence.

Ms. Neil's and NERA's evidence included descriptions of TSTT's Costing Methodology. These described a fully allocated cost ("FAC") model based on historic cost accounting convention which allocates all of TSTT's costs and revenue to products and services using the principles of activity-based costing.

While this description showed the same historic approach to fixed and mobile services, Ms. Neil's and NERA's evidence was that with respect to mobile services, TSTT had adjusted this historical cost model to update it with forward-looking information and assumptions to derive forward-looking costs.

Additional capital expenditure of TT\$ 730 million was assumed based on planned investment in 2005/2006. Assets used for the TDMA network alone were excluded because the TSTT network is in a process of transition from a combination of TDMA and GSM technologies to GSM only, and competition has begun in the mobile sector. According to the evidence submitted, the model is adjusted to assume that all of the TDMA sites had been replaced by GSM sites in accordance with TSTT's planned network evolution.

Fixed transmission costs were determined by the number of circuits used multiplied by what TSTT considered would be the equivalent wholesale market price. The assumption about TSTT's annual traffic volumes was derived from TSTT's actual traffic over six months in 2005, adjusted to reflect TSTT's likely market share in a three-operator market when it reaches a steady state. Operating costs were based on historic expenses of the

previous financial year.

NERA's opinion was that TSTT's cost model produces reasonable cost estimates for TSTT's services, particularly for mobile termination costs and the magnitude of the access deficit. NERA characterized it as a sophisticated cost model that reflects standard costing principles and methodologies and is generally consistent with international best practices. NERA viewed TSTT's approach to calculating mobile services as a sound and reasonable means of attempting to measure forward looking costs. The assumptions contained in the calculation result in mobile termination costs that reasonably approximate those of a reasonably efficient mobile carrier operating in Trinidad and Tobago. NERA also concluded that uniform mobile termination rates based on the results of TSTT's cost model would promote economically efficient competition. Ms. Neil's evidence indicated that the Authority had asked to review TSTT's cost model and that this review had commenced in January 2006.

Evidence was also provided by the Panel Expert regarding the parties' cost models. The Panel Expert's terms of reference were to provide its expert opinion on the reasonableness of the inputs to and assumptions in the cost models, the verifiability of the costs, the mechanical aspects and the outputs of the cost models, including principal differences between them. The Panel Expert's opinion was to be provided with a view to determining the extent to which each party's cost model is suitable for measuring its unit mobile termination costs and is consistent with international best practice for determining termination costs of a new entrant and incumbent at the stage of initial liberalisation of the market. The Panel Expert's opinion was also required as to whether either cost model provides a reasonable estimate of the mobile termination costs of an efficient mobile operator in Trinidad and

Tobago in general terms, as well as of an efficient new entrant.

The Panel Expert's evidence was that neither Digicel's nor TSTT's cost model corresponds to the generic types of costing methodologies most commonly referred to when determining interconnection costs (LRIC, TELRIC bottom up, TELRIC top down, and FDC). According to the Panel Expert, neither cost model relies upon "long run" costs, in that their depreciation methodologies do not lead, or have not been changed, to constant annuities. In addition, Digicel's model includes unused network capacity and both models have considerable uncertainty about the treatment of common costs which would require further work to address. No assessment could be made regarding the efficiency of operational expenses without further auditing.

The Panel Expert's conclusion that neither cost model was a "long run" cost model was not contested by Digicel in cross-examination or submissions. TSTT had not characterized its cost model as "long run" as such but as a historical cost model adjusted to provide mobile costs for an efficient operator operating in a steady state market.

The Panel Expert's evidence stated that it had assessed the inputs including blended minutes of usage ("MoUs") per subscriber, total number of subscribers, routing factors, distribution of calls, asset life times and cost of capital. The Panel Expert found that both models are robust in terms of their reactions to the input variables. Thus the mechanisms of the models function effectively.

According to the evidence submitted by the Panel Expert, subscriber numbers and MoUs are the most critical input variables in both models, as per minute unit mobile termination costs change in inverse proportion to the total forecast traffic volumes. The Panel Expert submitted that cost of capital is a

significant factor for the outcome of Digicel's model, less so in TSTT's. It expressed the view that both Digicel's cost of capital (20.6%) and TSTT's (16.2%) were consistent with international practice and so reasonable for the initial phase of competition in Trinidad and Tobago.

The Panel Expert's examination found that routing factors and the distribution of on-net calls (e.g., Digicel customer to Digicel customer) and off-net calls (e.g., Digicel customer to TSTT customer) were not significant in the evaluation of termination costs. Asset life times were nearly the same for each operator and were not significant in this respect either.

Both models were similar in that each relied on the best available technology (GSM) and so are dynamically efficient.

The Panel Expert's evidence included a comparison of Digicel's and TSTT's cost models, which the panel considers relevant in determining the mobile termination costs of an efficient operator in Trinidad and Tobago. Since further reference will be made later to the evidence, those parts of the Panel Expert's concluding findings which the panel finds most relevant here are set out below:

As far as the network efficiency is concerned, Digicel's cost model does not evaluate the mobile termination costs of an efficiently operated network, because the volumes in the cost model do not correspond to the capacity of the network installed. TSTT's model does, however, correspond to an efficient network. The network of TSTT is efficiently operated because TSTT is an earlier entrant in the Trinidad and Tobago mobile

market and has therefore sufficient volumes.

[...]

Overall we conclude that Digicel's and TSTT's cost models are suitable to produce mobile termination costs, notwithstanding the issue of Common costs that requires closer investigation for both cost models. They are fairly robust with respect to critical inputs (Forecast volumes, Cost of Capital – WACC) and no major criticism can be made of the reasonableness of the inputs.

Nevertheless, the termination costs of the two cost models are not directly comparable because:

-- TSTT's cost model evaluates mobile termination cost corresponding to the year when "static efficiency" is reached. The network is operated efficiently, because its maximum capacity corresponds exactly to a reasonable assessment of the market share to be expected by TSTT at the end of the initial phase of liberalisation.

-- Digicel evaluates mobile termination cost at a significantly lower level of efficiency and hence calculates a higher termination cost. Digicel calculates an average rate over a 15 quarter periods, between the start of its activity and end of fiscal year 2008/2009. The traffic volumes used in the cost model are

reasonable in relation to the plans that Digicel submitted to obtain its concession, but the traffic volume for 2008/2009 does not correspond to “static efficiency”, because the network is not operated at the maximum of its capacity.

Indeed, when comparing Digicel's and TSTT's costs models at the stage of “static efficiency” (assuming that “static efficiency” is reached for Digicel at the end of FY 2008/2009) and assuming identical WACC, the two models show fairly comparable results, (see *Table 1: Comparison of TSTT's and Digicel's at static efficiency* below), with Digicel's costs being slightly below those of TSTT's.

Table 1: Comparison of TSTT's and Digicel's at static efficiency

In US \$ per minute (Tax Excluded)	WACC = 16,2% for TSTT WACC = 20,6% for Digicel	WACC = 16,2% Both operators	WACC = 20,6% Both operators
TSTT cost model	0,072	0,072	0,076
Digicel cost model	0,066	0,061	0,066
Difference Digicel / TSTT	-0,006	-0,011	-0,010

Source: analysis TERA

When the models are compared under these similar conditions of static efficiency and WACC, the differences remaining may be due to the following:

- TSTT has used top down inputs to its cost model and Digicel has used bottom up inputs to its cost model;
- TSTT uses a higher level of OPEX in its cost model compared to that in Digicel's cost model.

These differences tend to increase TSTT's termination costs compared to Digicel's termination costs.

Figure 1: Explaining the difference in the outputs of TSTT's and Digicel's cost models below illustrates the three different steps needed to compare the output of Digicel's cost model with the output of the TSTT's cost model.

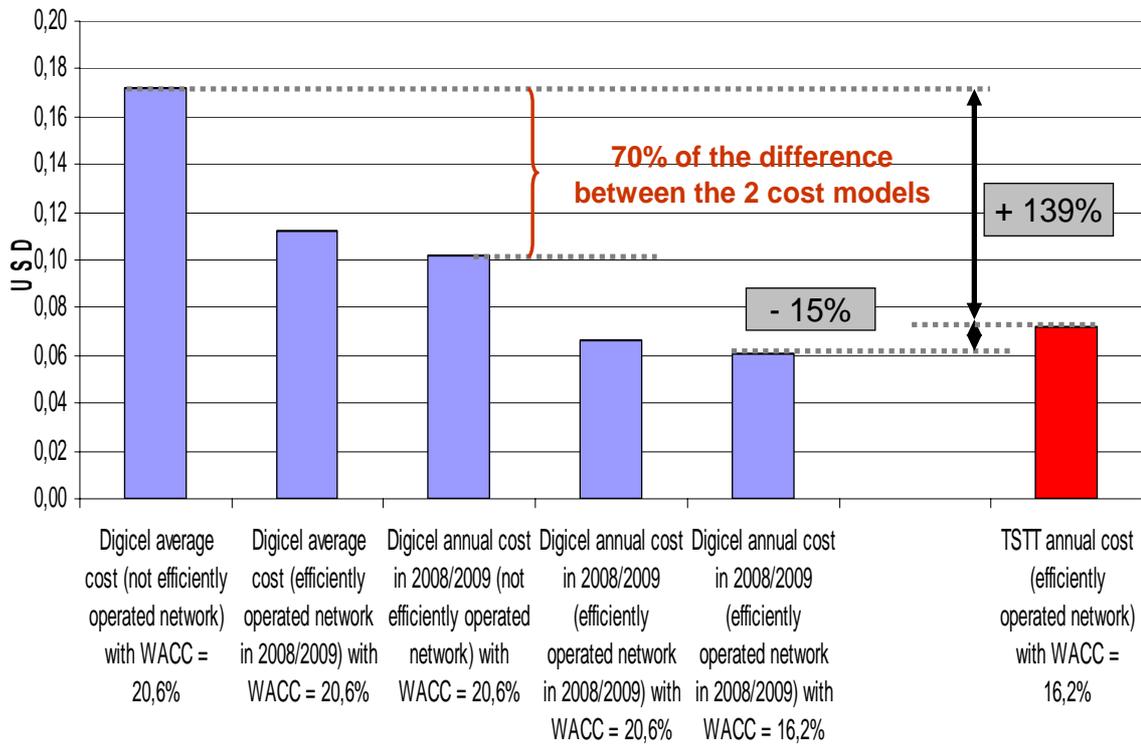
Changing from average mobile termination costs over the 15 quarters period to annual mobile termination costs in year 2008/2009 brings the output of Digicel's cost model from 0,172 down to 0,102 USD per minute. 70% of the difference between the outputs of TSTT's and Digicel's cost models as presented to the Panel is therefore due to this first step (shift from average value of Digicel to FY 2008/2009 annual value of Digicel).

Changing Digicel's cost model from annual termination costs in year 2008/2009 to annual termination costs of an efficiently operated network in year 2008/2009, by increasing the traffic levels in the Digicel's network, brings the output of Digicel's cost model from 0,102 down to 0,066 USD per minute. This second step (shift from FY2008/2009 annual value of Digicel without enough traffic to FY2008/2009 annual value of Digicel with network used at full capacity) is sufficient to bring Digicel's annual mobile

termination costs below TSTT's annual mobile termination costs.

Changing from annual termination costs of an efficiently operated network in year 2008/2009 to annual termination costs of an efficiently operated network in year 2008/2009 with a WACC of 16,2% instead of 20,6% brings output of the Digicel's cost model from 0,066 down to 0,061 USD per minute, i.e. 15% below TSTT's mobile termination costs. This is in the range of what is expected for cost models with broadly similar structure and assumptions.

Figure 1: Explaining the difference in the outputs of TSTT's and Digicel's cost models



Source: analysis TERA

The analysis above is merely a means to compare the outputs of the two cost models. In terms of the suitability of the cost models during the initial phase of liberalisation, only Digicel's cost model can calculate its own mobile termination costs on an annual and on an average basis. However, the notion of "an efficient new entrant mobile operator in Trinidad & Tobago" (see Terms of reference) cannot be defined from an economic point of view for the very first years of activity, because of the need to deploy fairly quickly a mobile network over the whole Trinidad and Tobago. In contrast, TSTT's cost model computes the annual

termination costs of an efficient network after the initial phase of liberalisation, and would need to be adjusted in terms of actual traffic levels in order to correspond to the initial phase of liberalisation.

The parties did not dispute any of the evidence or opinions of the Panel Expert, including the conclusions above, although TSTT did note in its submissions that the Panel Expert had been unaware of TSTT's evidence that TSTT's mobile network operated only in the 1800MHz spectrum band whereas Digicel used paired spectrum in both the 900MHz and 1800MHz bands. Nor did either party express any concern about the process by which the Panel Expert reached its conclusions or the parties' opportunity to cross-examine. The panel accepts these conclusions of the Panel Expert.

The panel found the most striking aspect of the Panel Expert's evidence to be the principal reason it identified for the wide difference between the results of Digicel's and TSTT's cost models. This concerned Digicel's model's calculation of an average of its unit termination costs over its first 15 quarters.

TSTT argued that this was an uneconomically short period, shorter even than the five year term of the interconnection agreement to be entered into between the parties. The 2003 UK Competition Commission report to which Digicel's witness Mr. Gunnigan referred (see section 2.2(c) of this decision) determined that the appropriate time period for a LRIC model is "the long run". This was defined by the UK Director General of Telecommunications as "the period over which all assets can be replaced." The Competition Commission defined it as "the period over which the [mobile network operator] has complete flexibility with respect to how it configures its network" (page 66 at paragraphs 2.258 – 2.260, and page 145 at paragraph 7.24).

The panel agrees with TSTT that Digicel's selection of a 15 quarter period is uneconomically short as the basis for determining Digicel's costs for the purposes of interconnection charges. The evidence before the panel is consistent that traffic volumes vary in direct inverse proportion to unit costs, and that Digicel's traffic volumes started at zero and will grow over time. It is clear, then, that the costs resulting from Digicel's cost model are higher than they would be had Digicel chosen a long run time period.

The Panel Expert's evidence, confirmed by Digicel, showed that in 3 quarters of the 15 quarter period there was no traffic activity. According to Digicel, this was because it had incurred substantial costs prior to commencing services. The Panel Expert gave evidence that the inclusion in the cost model of 3 quarters preceding activity on Digicel's network was "incorrect" in a long run cost approach. This is because a long run cost approach considers there to be no delay between investment and activity (it assumes a "steady state"). The panel considers that the calculation of an average of 15 quarters of costs over 12 quarter periods of traffic volume would likely distort the result if considered in terms of LRIC modelling, producing a higher cost per unit. The distortion is all the greater because of the shortness of the 15 quarter period, of which 3 quarters is a significant proportion.

According to the evidence of Digicel and Analysys, Digicel's cost model is suitable for calculating its own costs during the 2006-2009 period it covers. There is no suggestion in Digicel's submissions that, as a new entrant, Digicel can operate its network efficiently during that period. Under its cost model assumptions, it will not have the volumes of traffic necessary to operate efficiently – i.e., its calculation will necessarily include some, indeed considerable inefficiency. Digicel's submissions did not, then, suggest that its cost model calculates the costs of mobile termination of an efficient mobile operator, or even of Digicel's network operating at an efficient level. This

was confirmed by the evidence of the Panel Expert. The Panel Expert did, however, derive from it information relevant to determining the costs of an efficient operator, as seen later.

Turning to TSTT's cost model, Digicel argued that TSTT's cost model cannot be producing the mobile termination costs of TSTT – in effect, whether efficient or not. Digicel asked TSTT's witness, Ms. Neil, in cross-examination to calculate TSTT's margin on fixed-to-mobile calls and concluded that it could be inferred from TSTT's fixed-to-mobile retail prices that TSTT's costs of mobile termination could not be as low as it claimed (Day 3, pages 162-185). The only alternative to this conclusion would be that TSTT's margins on its fixed-to-mobile calls were extraordinarily high, which would be unthinkable – assuming TSTT was being fair to its fixed line customers. This was consistent, Digicel argued, with its claim that TSTT was setting an artificially low mobile termination charge. TSTT disputed Digicel's calculation method.

In the panel's view, even if TSTT's margins on fixed-to-mobile calls are high, Digicel's line of reasoning was unconvincing both with respect to the calculation and ascertaining whether TSTT's cost model produces a reasonable estimate of the costs of mobile termination of an efficient operator. TSTT is a historical monopoly and it is not beyond imagination that TSTT's margins for fixed-to-mobile calls may still be substantially in excess of costs. High margins on fixed-to-mobile calls would hardly be a new phenomenon worldwide where mobile termination costs have not been regulated.

This is not to suggest that TSTT's retail prices for fixed-to-mobile calls are justified. Although retail prices are not the subject of this proceeding, both parties referred to the effects of this dispute on fixed-to-mobile retail prices. The concern that the benefits of achieving cost-based mobile termination be “passed through” to fixed line callers is reflected in the reports of regulatory

authorities referred to in the parties' submissions. In its recommendations which follow this decision, the panel revisits this concern.

Digicel put forward other reasons that TSTT's cost model should be viewed as underestimating the cost of mobile termination. These related to the suggestion that TSTT had over-invested in its network and that its network was provisioned for a higher number of subscribers than was assumed in the cost model. TSTT's evidence was that the investment in its network was included in the cost model costs, and the subscriber number used in its cost model was lower than its current number of subscribers due to a forward looking estimation of its share of the competitive market at steady state. Following this through, TSTT's cost model would actually be expected to produce an even lower mobile termination cost.

Digicel argued that producing such even lower mobile termination costs would make TSTT possibly one of the most efficient and low cost providers of mobile termination services in the world, implying that this showed the basic faultiness of the TSTT cost model. The panel was not convinced by this line of argument, particularly as Digicel's main thesis was that TSTT's costs are actually higher than its cost model calculates.

Digicel also sought to establish that TSTT would have a clear incentive to impose an artificially low (and below cost) reciprocal mobile termination charge because it would enable TSTT to impose a loss on other mobile operators without suffering those losses itself. Any losses in mobile termination to TSTT would be offset by savings for TSTT's fixed division because the fixed division is paying the mobile division – i.e., it is all internal to TSTT. The losses incurred by other operators would deprive them of significant cash flows at the time of market entry and gift TSTT with significant

cash flows to resource its marketing campaign.

The panel agrees with Digicel that such an incentive can reasonably be expected to exist but this does not prove that TSTT's cost model result of TT\$0.45 (US 7.2 cents) is indeed below cost. Strategically advantageous reasons for complying with the law do not make it non-compliance. The panel weighed Digicel's arguments and concluded that they did not substantially undermine the view expressed by the Panel Expert that TSTT's model did represent the costs of an efficient operator.

As shown above, the Panel Expert's evidence was that it was possible to use the data in Digicel's cost model to compare Digicel's cost model with TSTT's assuming Digicel's network operating at full capacity, i.e., at static efficiency, in a single given year. The result of US 6.6 cents derived from applying Digicel's cost model at static efficiency is remarkably close to TSTT's US 7.2 cents, which TSTT claims represents an efficient cost.

(b) Evidence from international benchmarks

It is clear from section 14 of Schedule H to the Concessions, and the panel finds, that benchmarks are ordinarily to serve as a secondary source of information after cost model information. As described above, evidence regarding cost model data has been submitted to the panel although not pursuant to any methodology specified by the Authority. Benchmark evidence may, then, be a valid and valuable source of guidance relating to interconnection charging, including with respect to whether reciprocal charging is permissible.

Digicel submitted benchmark evidence from Caribbean and European countries through its expert Mr. Gunnigan of DotEcon in support of the

mobile termination charge resulting from Digicel's cost model, and to question the credibility of TSTT's proposed mobile termination charge.

Digicel's experts, DotEcon, presented demographic information for several Caribbean island economies, including geographic area, population, population density and GDP per capita, suggesting that there were significant similarities between them and Trinidad and Tobago. In most of them, Digicel was the second market entrant and so had first-hand data on mobile termination charges. The DotEcon report introduced the Caribbean countries as having legislation requiring interconnection services to be cost-based or cost-oriented, and thus relevant to Trinidad and Tobago where cost-based interconnection charging is prescribed. According to the evidence presented, Digicel's mobile termination charges in these countries were in the range of TT\$1.20 to 1.33 (US 19.2 to 21.3 cents).

The DotEcon reports also presented European benchmarks, selecting operators with a market share beneath 20%. This percentage limit was explained by reference to statements of various European regulators which differentiated between smaller, new entrant operators whose costs may be higher due to inability to reach the static efficiency levels of the larger operators which enjoyed economies of scale. Mr. Gunnigan of DotEcon also considered that a 20% market share was an appropriate threshold for benchmarks given the challenge Digicel faced in achieving that level in a highly penetrated market such as Trinidad and Tobago. (His report would have been prepared before Digicel's actual level of penetration in its first quarter of activity, which is discussed later in this decision, was known.) The DotEcon evidence was that the selected European benchmarks for mobile termination charges showed a range of TT\$1.11 to 1.29 (US 17.8 to 20.6 cents).

Digicel's experts concluded that Digicel's proposed mobile termination charge was in line with the benchmarks. Further, Digicel argued, the benchmarks undermine the credibility of TSTT's cost model result on which its proposed charge was based. Digicel pointed out that TSTT's proposed mobile termination charge is far below the Caribbean benchmarks while TSTT's proposed fixed termination charge was consistent with Caribbean benchmarks. This showed TSTT was trying to impose a low sector-wide mobile termination charge.

TSTT challenged the benchmarks put forward by Digicel on several grounds, which the panel considered. The argument put forward by TSTT that the panel considered most relevant was the insufficiency of evidence that the benchmarks were based on costs as required by section 25(2)(m) of the Act and Article 14(2) of Schedule H to the Concessions.

NERA's evidence referred the panel to guidance provided by the European Commission to the Luxembourg Institute of Regulation in 2006 regarding the use of benchmarking. The European Commission had indicated the importance of selecting countries based on objective criteria, and of relying upon prices set on the basis of an appropriate cost accounting model and relevant cost accounting data to reflect cost orientation.

Although the legislation in the Caribbean countries required cost-based or cost-oriented interconnection charging, no evidence was put before the panel suggesting that any of the Caribbean countries in question had arrived at the charges through any process aimed at relating the charges to costs. Indeed, to the contrary, TSTT presented evidence of its witness Mr. McNaughton of Cable & Wireless who had been involved for Cable & Wireless in the setting of interconnection charges between Cable & Wireless and Digicel in Barbados, the Cayman Islands, Grenada, St. Vincent and St. Lucia (all of which, the

evidence stated, were reciprocal charges). Mr. McNaughton's evidence was that in none of these countries were the charges determined, whether by the parties or the regulators, pursuant to a process designed to relate them to costs. Digicel did not contest this evidence.

Furthermore, the Caribbean country whose geographic and population profile most resembles Trinidad and Tobago – Jamaica – had a considerably lower mobile termination charge than the others. Jamaica happened to be omitted from DotEcon's principal benchmark analysis without convincing reason, despite reference to Jamaica in a previous DotEcon report. This and other factors raised doubts about the objectivity of the selection of the DotEcon benchmark evidence.

TSTT argued that European benchmarks did not represent cost-based charges either. Relying upon evidence provided in the DotEcon report as well as NERA's reports, TSTT submitted that European mobile termination charges have historically been unregulated. To the extent they are now regulated, they are on a "glide path" towards costs. Regardless of how costs may be determined in each jurisdiction, the trend is downwards towards costs – but without having reached them. The benchmarks, according to TSTT, offer little evidence of costs, let alone costs in Trinidad and Tobago. Neither Digicel nor its witnesses presented any convincing arguments or evidence to the contrary.

TSTT did not present a benchmark analysis of its own. TSTT and NERA proposed that a benchmarking exercise contemplated in section 14(2) of Schedule H of the Concessions would have to be along the lines conducted, for example, by the NZCC in its Investigation into Regulation of Mobile Termination. NERA submitted the benchmark findings of the NZCC and,

having reviewed the NZCC reports to which NERA referred, the panel considers it worthwhile to note some of the NZCC's findings.

Building on the work of the Australian Competition and Consumer Commission, the NZCC considered the methodologies of various companies and regulators and selected ten. It made its selection on the basis that it identified them as having moved to cost-based mobile termination charges. In its Reconsideration Final Report of 21 April 2006, the NZCC found average mobile termination cost estimates to be NZ 10.94 cents, or about TT\$0.42 (US 6.7 cents), using the exchange rate of NZ\$ 1.00 = US 61.6 cents employed by NERA.

As it had explained in its Draft Report of 18 October 2004, however, the NZCC considered it appropriate to use the 75th percentile average instead due to risks attached to using a small number of available benchmarks. This is consistent with the risk identified by Digicel's expert witness Mr. Gunnigan in his evidence regarding the wide range of the benchmarks in the NZCC's study and the risks this poses for relying upon an average. In the NZCC's 2006 report, the 75th percentile produced a termination charge of NZ 13.73 cents, or about TT\$0.53 (US 8.5 cents), about 25% higher than the average mentioned above. TSTT's cost model result is on the low side compared to this.

The account of the NZCC study would not be complete without noting that, taking into account overseas regulatory cost models and New Zealand cost estimates, the NZCC concluded in its 2006 report that a charge of NZ 15 cents, or about TT\$0.57 (US 9.2 cents) was the appropriate rate to assume for costs in New Zealand. The NZCC provided for step reductions downwards to the rate of NZ 12 cents, or about TT\$0.46 (US 7.4 cents) at the end of

2009/2010.

DotEcon provided various arguments as to why the NZCC's results should not be relied upon in Trinidad and Tobago. Traffic flows would be different in the three U.S. operators referred to since they operated on a receiving-party-pays basis ("RPP"). Figures from South Korea and Israel should be viewed in the context of the high usage of those countries, argued DotEcon. TSTT submitted that Trinidad and Tobago is a relatively high usage country itself. DotEcon also noted that cost-based figures from Austria were different from the charges actually used, but this only served as greater confirmation in the panel's mind that actual rates in Europe may be declining towards, but not yet reaching costs. The panel considered the DotEcon arguments, as well as the evidence elicited in cross-examination (Day 1, page 186-198).

Upon review of the benchmark evidence, the panel finds that the Caribbean and European benchmark evidence presented lacks relevance and does not represent the sort of cost-based benchmarking approach that would be appropriate in the context of establishing cost-based interconnection charges in Trinidad and Tobago under the Act and Concessions.

The panel has little difficulty in believing that TSTT's mobile termination costs are well below the benchmarks for other Caribbean countries since there is no evidence that these benchmarks reflect costs. Experience worldwide – for example illustrated by the UK and New Zealand reports cited by the parties – suggests that mobile termination charges are likely to be substantially above costs without regulatory efforts to base them on costs.

The panel notes the disparity between the alignment of TSTT's proposed fixed termination charge with the Caribbean benchmarks and the non-alignment of its proposed mobile termination charge with the equivalent mobile

benchmarks. The fixed termination charge, however, bears less relevance in the dispute before the panel. On the other hand, to the extent that Digicel's proposed mobile termination charge is aligned with Caribbean and European benchmarks reasonably expected to be above costs, such benchmarks may even undermine rather than support Digicel's claims about its costs.

The panel agrees with TSTT that the NZCC's overall approach is a good example of appropriate benchmarking, although in the panel's view, a section 14(2) benchmarking exercise in Trinidad and Tobago need not necessarily rehearse all of the same steps independently. In the panel's view, further study would be needed to determine whether the factors identified by DotEcon affect the relevance of the NZCC benchmarks to Trinidad and Tobago. Further study would also be appropriate to consider whether adjustments to the benchmark data would be necessary for the purposes of use in Trinidad and Tobago. Nevertheless, the findings of the NZCC do represent the best, indeed the only, evidence of benchmarks based on costs put before the panel in this proceeding and as such they have relevance here.

(c) The evidence points to a reasonable range of efficient costs

The panel finds that the Panel Expert's evidence that TSTT's cost model is suitable for determining the mobile termination costs of an efficient operator in a steady state market is consistent with the evidence submitted by NERA and TSTT's claims. This evidence is also consistent with the Panel Expert's finding that Digicel's cost model, if used to calculate its unit cost of mobile termination operating at full capacity (i.e., "static efficiency"), actually produces a cost very close to TSTT's, even when using Digicel's higher cost of capital. The benchmark findings of the NZCC regarding average mobile termination costs are fairly closely aligned with these.

Taking into account all of these factors, the panel finds that the cost of mobile termination of a typical efficient operator in Trinidad and Tobago in a steady state market is within a reasonable range comprised of TSTT's cost model result, the NZCC Report's 75th percentile and the Panel Expert's finding of Digicel's cost at static efficiency. The panel finds that this range is narrow enough that reciprocal charging cannot be excluded on the basis that the proposed rate is not that of an efficient operator.

The panel notes Ms. Neil's evidence that the Authority has commenced examination of TSTT's cost model. The Panel Expert evidence stated that there was uncertainty about TSTT's treatment of common costs, and that it had not reviewed TSTT's operational expenses, although the Panel Expert stated that this did not affect the conclusions it did set out. The panel cannot rule out the possibility that the Authority may probe yet more deeply into TSTT's cost model than the Panel Expert. Should the Authority find that TSTT's cost model requires adjustment, the appropriateness of a reciprocal charge determined by reference to it would appropriately be reviewed from the time such charge took effect.

2.4 Are the operators providing the same service under similar conditions?

Digicel made several arguments to the effect that there were differences between it and TSTT that were so significant that their costs could not be expected to be the same, and indeed are not. Since their costs could not be and are not the same, their charges must not be required to be the same – one should not compare apples and oranges.

The difference between the two operators in terms of market entry is discussed in the next section. The question addressed here is whether the

operators are providing a service which is so different, or under such different conditions that even operating at static efficiency their costs cannot be expected to be the same.

Concessions may provide different rights to provide services, and impose different obligations on operators. It is possible that these might cause operators to have access to more efficient technologies or have different costs at static efficiency.

The parties' Concessions give each the same right to operate a public mobile telecommunications network and provide services on it. Apart from the Concessions, competitive forces likely require both operators to offer a similar level of geographic coverage to their customers, and Digicel may not be able to avoid this even if its coverage obligations provide for a staged rollout of its network across the territory of Trinidad and Tobago.

While the evidence shows that Digicel uses GSM and TSTT today uses a combination of GSM and TDMA technologies, TSTT's cost model is forward looking in assuming TSTT's migration to GSM only is completed. Thus even if using different technologies for the same licensed service were a legitimate difference to consider (e.g., if the licensed frequencies imposed different technologies upon the parties), the same technology is used to determine costs.

TSTT has the right under its Concession to operate a domestic fixed telecommunications network and provide services on it, a right which Digicel does not have. This could give the mobile business access to TSTT's fixed line network, resulting in a different potential level of static efficiency. Indeed, Digicel claims that TSTT enjoys economies of scope not available to Digicel because TSTT's mobile network "piggybacks" on its core fixed network

whereas Digicel's transmission network requires radio links between cell sites.

TSTT gave evidence that its cost model provides for an imputed payment from the mobile division to the fixed division for the network service rendered. This imputed payment is at the price TSTT would offer to wholesale customers. Digicel argued that nevertheless, as the fixed transmission network would be carrying both fixed and mobile traffic, and as unit costs were a function of unit volumes, the access to the fixed network would reduce TSTT's costs of mobile termination. There was inadequate evidence before the panel to verify this claim, although as speculation it is not unreasonable.

Different licence rights may also provide different frequencies that may affect the cost of achieving a certain network capacity. TSTT brought evidence through its witness Mr. Ramgoolam, TSTT's head of network planning. Mr. Ramgoolam's evidence was that despite requesting paired spectrum from the regulator, TSTT's GSM network was only permitted to use spectrum in the 1800MHz band. The 1800MHz band has a smaller geographical footprint and greater indoor signal attenuation compared with the 900MHz band. Thus TSTT would have to incur material additional expenditure compared to if it had paired spectrum – as Digicel has. NERA referred to a report of the UK regulator Ofcom which produced a mobile termination cost about 12% higher for an operator using the 1800MHz band than operators using both the 900MHz and the 1800MHz bands.

Mr. Barrins provided evidence that cooperation between Digicel and TSTT to minimize the proliferation of towers suggested that TSTT had the same number of sites as Digicel. There were also inconsistencies, according to Mr. Barrins, regarding the alleged cost of collocation.

None of the licence and technology conditions described above led the panel to think that Digicel would operate at a different level of static efficiency than TSTT.

TSTT also brought evidence that its workforce is unionized, arguing that this would add costs in comparison to Digicel's, which is not. Digicel did not contest that TSTT was unionized, although argued that its own labour costs would be at least as high, perhaps higher. As a new entrant it had to lure away employees from TSTT or train graduates from other industries. Both companies submitted that the other would likely enjoy back-office savings and economies of scale in vendor purchasing due to TSTT's incumbent status and its relationship with Cable & Wireless, and in the case of Digicel due to its region-wide presence.

The panel considers the arguments regarding workforce costs and regional economies to be less relevant than imposed licence or technology conditions might be to considering whether differences in the service or conditions would make their costs at static efficiency necessarily different. In any event, on the balance of the evidence, the panel is unconvinced that there are economies of scope resulting in significantly different costs for TSTT and Digicel. This view is fortified by the Panel Expert's comparison of TSTT's mobile termination cost with the calculation of Digicel's mobile termination cost at static efficiency. The Panel Expert evidence showed that Digicel's network operating at static efficiency has a lower mobile termination cost than TSTT's – i.e., despite any economies of scope that TSTT might enjoy.

The parties exchanged arguments and evidence concerning their costs of capital. The arguments concerned in significant part the costs of capital appropriate for a new entrant and an incumbent. Although section 2.5 of this decision discusses the differences between a new entrant and incumbent, it

is opportune to address the cost of capital assertions here because the evidence leads to the same conclusion with respect to cost of capital as the other matters addressed in this section.

Digicel argued that it employs a higher cost of capital than TSTT because as a new entrant it faces a higher level of risk than TSTT, and that this would make its costs higher than TSTT's. The parties submitted various arguments and evidence about calculating cost of capital, and whether Digicel as a new entrant would have a higher cost of capital than TSTT and by how much. The Panel Expert gave evidence that it had examined the effect of TSTT's and Digicel's costs of capital on their cost models. Using TSTT's cost of capital in Digicel's cost model would lower Digicel's calculation of its average mobile termination cost over 2006-2009 by 9%, so cost of capital was clearly significant to its cost model.

The Panel Expert's comparison of Digicel and TSTT operating at static efficiency is just as relevant here. It showed that at static efficiency, TSTT and Digicel have very close mobile termination costs despite different costs of capital.

On the evidence before the panel, the panel concludes that the parties' operating conditions are similar enough that reciprocal charging should not be prevented.

2.5 Would reciprocal charging in the initial period of liberalisation frustrate the purposes of the Act?

In the panel's view, Digicel's most compelling arguments concerned its position as a new entrant, economies of scale, the high up-front capital costs in, and the level of maturity of, the Trinidad and Tobago mobile

telecommunications market.

Digicel brought evidence through its expert consultants DotEcon that costs incurred by a mobile network operator are likely to vary systematically between incumbents and new entrants.

The parties' evidence was generally consistent in recognizing that large up-front fixed costs, which will not vary with changes to traffic volume, are necessary for an operator to cover Trinidad and Tobago. It was also recognized that unit mobile termination costs are significantly a function of unit volumes, i.e., call traffic. The higher the traffic, the more units there are to allocate the aggregate cost to and, since the fixed costs will not vary, the lower therefore the unit cost will be. A new operator coming into the market starts with zero units of traffic and will have less units of traffic than the incumbent operator for a substantial period.

The parties did not disagree that a new entrant will not initially be able to attract the number of subscribers to produce volumes of traffic sufficient to use its network at full capacity, and therefore it cannot commence business at a level of static efficiency. According to the evidence of the Panel Expert:

These considerations have a major consequence on the static efficiency of an earlier entrant vs. a later entrant, if the earlier entrant has been operating for several years and if the later entrant has just launched its service. The later entrant cannot operate its network efficiently as there are not enough minutes of traffic in its initial years of activity. This situation is typical of the initial phase of liberalisation of the

market.

Digicel argued that it was good policy to take into account these economies of scale, appealing to European experience. DotEcon referred to the 2003 UK Competition Commission Report, which observes that lower volumes will mean greater unused capacity on the cell sites that are needed to provide coverage, and that this is more significant at lower traffic volumes. DotEcon also referred the panel to statements of several European regulators and the European Regulators Group, which suggested asymmetric termination charges were reasonable, allowing smaller or new operators to charge higher rates taking into account the economies of scale advantage of the incumbent.

NERA argued that it was not good economic policy to sustain inefficiencies in the market and provided evidence that operators in several European countries – an increasing number – apply reciprocal charges. In the panel's view, this does not undermine the thrust of the DotEcon evidence that the overall pattern in Europe has been for later or smaller mobile entrants to have higher mobile termination charges than earlier or larger mobile operators, and that this is being explained in terms of economies of scale. Most of the European mobile markets referred to are now fairly developed and competitive. Even if many now do, or very shortly will, have reciprocal charging, this does not indicate that asymmetric charges would today be viewed as inappropriate in Europe for new entrants at a time of initial liberalisation.

The issue posed by Digicel for the panel is how to approach the accepted fact that, as a new entrant, Digicel simply cannot for some time operate at static efficiency whereas TSTT can. The evidence showed how this problem becomes all the more difficult for the new entrant when one considers the

level of maturity of the market.

The evidence before the panel from the parties' call records shows that the market is at least three-quarters penetrated, even assuming that all of Digicel's customers also hold TSTT phones.

The Panel Expert gave evidence that the initial phase of the market depends upon the existing level of penetration, which in Trinidad and Tobago is high, i.e., the market is already approaching maturity. As a result:

The consequences of such an asymmetry of market shares when competition starts in a maturing market is that the path from costs at the start of competition to costs at the stage when static efficiency is reached by the new entrants is very different for the incumbent and for the later entrants:

-- An incumbent will see its total number of minutes in the network decrease quite significantly.

-- A later entrant will see its total number of minutes in the network increase quite significantly.

Mr. Barrins gave evidence from Digicel's experience in other Caribbean countries that there was a clear correlation between Digicel's ability to build market share and the maturity of the market. The greater the market penetration at the time of Digicel's launch, the lower its market share has been after a year. The panel found these to be consistent with the evidence of the Panel Expert.

The relevance of the maturity of the market, Digicel submitted, could also be seen from European experience. DotEcon plotted termination rates for 46 European operators that were second or later entrants, showing the relationship between (x) the length of time between the start of the first provider of digital mobile services and the network launch of each later operator in question, and (y) the mark-up in the termination charge of the new operator over the incumbent. This illustrated on an average basis that the longer the period of time elapsed between the first operator and the later operators entering the market, the higher the mark-up in termination charges the later operators tended to have.

It was conceded by DotEcon, as pointed out by NERA, with respect to all but three of the 46 operators in the DotEcon graph: that the mark-up over the incumbent's charge was below 40%; that for most it was below 20%; and that there were a significant number where there was no mark-up whatsoever – i.e., where charges were reciprocal notwithstanding late entry. The panel agrees with TSTT that these observations further undermine Digicel's request for a mobile termination charge with a 156% mark-up over and above TSTT's proposed charge, which the panel has found to be within a reasonable range of cost-based mobile termination of an efficient operator. These observations do not, however, disturb the conclusion that on the whole, in Europe, the later the first competitor has entered the market after the incumbent, the higher the asymmetry in their charges has been.

The Panel Expert gave evidence that with respect to more mature markets,

...symmetrical interconnection costs could only be reached at the later "static efficiency" stage ... which is NOT the initial phase of competition in Trinidad and Tobago. Once "static efficiency" is reached, and provided

there is no need to change technology (e.g. shifting from 2G mobile technology like GSM to 3G mobile technology), both earlier and later entrant operators should continue along approximately the same cost curve.

This places the new entrant at a severe disadvantage, argued Digicel. In the initial period, it will have high costs but low traffic, and so a measurement of its costs against traffic units results in an extremely high per unit cost.

The Panel Expert's evidence was that over the course of the initial period, Digicel's average per unit cost would be higher than its unit cost at a state of static efficiency. Digicel argued that this excess of average per unit costs in such a period over a charge based on costs of an efficient operator would be an economic loss. Furthermore, argued Digicel, TSTT's actual traffic volumes would be higher in the initial phase than assumed in a cost model at steady market state, in which its market share would be lower. Thus, TSTT would enjoy a "supernormal profit" on every minute of traffic it terminates for Digicel in this initial phase.

The importance of this observation, argued Digicel, is accentuated by the vulnerability of competition during the period of initial liberalisation. The supernormal profits would be available to TSTT to fund marketing campaigns and special promotions, subsidise handsets and retail services while the new entrants are trying to win subscribers from the former monopoly provider, TSTT. According to Digicel, then, reciprocal termination charging would create a structural bias in the mobile retail market and certainly not provide a level playing field. Indeed, it would represent a subsidy from Digicel to TSTT restricting Digicel's ability to compete effectively and forming a barrier to entry that would be anti-competitive. A central strand of Digicel's argument was

that applying TSTT's charge reciprocally would be contrary to the object of fair competition in the Telecommunications Act. In the panel's opinion, these arguments speak to the earlier statements in this decision regarding the objects of the Telecommunications Act and the panel considered them carefully.

TSTT and its expert NERA objected to Digicel's entire approach, positing that the types of start-up costs and transitory scale economy effects cited by Digicel were an economic fact of life that generally warrants no special treatment for new entrants into any industry.

The panel found Digicel's notion of "economic losses" problematic because "actual costs" in these circumstances become a function of whatever the selected period happens to be – whether the first day of activity, the first month, the first year, the first 15 quarters ending March 2009, the period until Digicel reaches static efficiency, until the end of the five year interconnection agreement, or a reasonable long run period.

The evidence before the panel showed that there are many ways in which an operator can conceptualize and allocate its costs of terminating calls. In an RPP regime, costs may be recovered from retail customers, and termination prices may or may not bear a direct relation to costs of termination. There are also different ways of identifying the aggregate costs of interconnection, as well as of allocating that cost to the interconnecting parties. In its discussion of symmetrical termination charges in the United States, NERA referred the panel to a paper which argued that the incremental costs of interconnection bear little or no relation to traffic volumes, and proposed a split incremental interconnection facilities (SIIF) rule whereby the parties split the incremental cost (Jay. M. Atkinson and Christopher C. Barnekov, "A Coasian Alternative to Pigovian Regulation of Network Interconnection", September 2004). The

use of Internet Protocol and development of new generation networks (NGN) is also affecting regulators' considerations of how to cost the termination of calls.

Many countries currently take the approach taken by TSTT and Digicel, which is to arrange to recover interconnection costs in large part through call usage charges, characterizing the termination of calls as a service to the originating operator. Any sensible determination of those charges requires constructing the cost per unit of traffic using certain conventions, i.e., cost model approaches, which have been mentioned above. Properly applied under the Act and Concessions, such conventions must aim at identifying economic efficient costs over the long run, not snapshots in which the operator would inevitably be calculated as making high losses.

As a broad principle, the panel agrees with TSTT that transitory scale economy effects are an economic fact of life of a new entrant. The existence of such "losses" is to be expected in the early periods under any long run costing approach applied to a new entrant. The argument that a new entrant should make no or minimal "loss" over its "actual costs" in the initial phase implies – and this would be consistent with the inappropriately short period Digicel selected for its cost model – that long run costing is simply inappropriate for a new entrant.

The cost-based references of the Act and Concessions are not there, in the panel's interpretation, to *guarantee* recovery of costs throughout any period while an operator is inefficient – even if the operator cannot escape the period of inefficiency due to the nature of the up-front capital investment. Rather, in the panel's view the cost-based requirements in the Act have been legislated to promote economic efficiency because competition is not expected to lead to it. In many businesses, a new entrant into a market will face a period

where it provides its product or service below the market price and often below its own costs in that period.

The panel accepts the evidence that the case of telecommunications networks, and particularly mobile networks where coverage must be immediate and nationwide, makes the challenge faced by a new mobile operator a particularly tough one. As a general business proposition, this makes it important that a new entrant in such a market ensure that it can finance its business sufficiently. Operators supported by the financial depth of a successful group of companies are likely to be more secure.

Digicel submitted, consistent with the Panel Expert's evidence, that the more mature a market is the longer the time the new entrant is likely to take to reach static efficiency. The panel is not indifferent to the high level of existing market penetration already achieved by the incumbent faced by Digicel in Trinidad and Tobago. It can reasonably be expected to raise the number of subscribers that the new entrant must attract from the incumbent as opposed to only attracting customers who have not yet subscribed to mobile services.

The panel recognizes that the combination of having to cover the full territory and the existing maturity of the market makes the challenge faced by a new mobile operator in Trinidad and Tobago all the more intimidating. Having regard to the objects of the Act discussed earlier in this decision, there is greater reason to take this factor into account if it appears that even a lean, well-managed, innovative new entrant using the best available technology will be unable to reach static efficiency for so long that its chances of attaining it at all are undermined, or if the establishment of effective competition in the market is prevented or seriously delayed.

The Panel Expert's evidence indicated that the period until a new entrant reaches static efficiency could last from 3-4 years to 8-10 years, depending on local circumstances.

Digicel's evidence, provided confidentially to the panel and the Panel Expert, included the number of subscribers (at assumed blended MoUs) at which its network would operate at full capacity. This shows that its cost model does not project Digicel reaching this number of subscribers within the time period of the cost model, which ends at the end of the financial year 2008/2009.

In assessing Digicel's cost model in terms of static efficiency, the Panel Expert simulated an extension of Digicel's model beyond its 15 quarter period. It did so on the basis of an assumption that Digicel's subscriber numbers would continue to increase thereafter at the same, low rate of growth the cost model assumes for its last year (i.e., 2008/2009). The Panel Expert performed this simulation in order to determine the date at which Digicel would, according to its model, reach static efficiency – i.e., the number of subscribers at the limit of network capacity with Digicel's assumed MoUs. The Panel Expert found this date to be March 2015 using Digicel's assumptions. Since Digicel began operation in 2006, this would be towards the long end of the range of time given by the Panel Expert for reaching static efficiency. The Panel Expert calculated average mobile termination costs of Digicel over this period – which is far longer than the 15 quarter period used by Digicel – to be TT\$0.56 (US 9.0 cents).

This evidence is a simulation based on an extension of assumptions used in the early years. There are therefore limits to the reliability of extending Digicel's cost model out in this way. Nevertheless, other than the benchmark evidence and reference to TSTT's calculated costs, this is the only evidence before the panel that may be used to estimate Digicel's average costs over

a reasonable period from commencement of operations. Neither the Panel Expert's methodology nor the result of US 9.0 cents was disputed or questioned by Digicel or TSTT.

TSTT argued that the Panel Expert's findings showed that this US 9.0 cent result was in fact very close to TSTT's cost of TT\$0.45 (US 7.2 cents). Indeed, using TSTT's cost of capital (16.2%) in place of Digicel's (20.6%), this US 9.0 cent amount would be adjusted to little over US 8 cents per minute. On cross-examination, the Panel Expert had acknowledged that a 16.2% cost of capital would not be unreasonable for Digicel. TSTT argued that this permitted the conclusion that even without holding Digicel to an efficient operator standard but to the average of its own cost model until it reached that status, its costs are reasonably symmetrical with TSTT's own proposed charge. Thus by paying Digicel a reciprocal charge in the range of US 7 cents, TSTT argued that Digicel would recover its economic costs.

The panel observes that this could apply in reverse. The evidence of the Panel Expert considered a range of 15-20% for TSTT and Digicel as a reasonable range for cost of capital in light of international experience and gave no indication of which was more appropriate for one or the other. At 16.2%, TSTT's cost of capital is towards the lower end of the range. Were TSTT's cost of capital to be increased towards Digicel's rate, TSTT's own cost model results would be a little higher. The Panel Expert calculated TSTT's costs to be US 7.6 cents if TSTT's cost model applied Digicel's 20.6% cost of capital, which is a little closer to the NZCC 75th percentile amount than TSTT's own calculation.

Regardless of the cost of capital employed, however, the panel finds that Digicel's costs calculated over an appropriate long run period will come far closer to the reasonable range for costs of an efficient operator than if

Digicel calculates the average over the inappropriately short period of 15 quarters. It reduces very considerably the amount of “economic losses” Digicel claims to have even based on its cost model assumptions as extended by the Panel Expert. The panel finds that this weakens considerably Digicel's arguments that reciprocal charging should not apply.

Nevertheless, it would still represent an economic loss, according to of Digicel – on the figures before the panel, a loss on average of TT\$0.11 (US 1.8 cents) per minute if using TSTT's proposed charge of TT\$0.45 (US 7.2 cents).

The panel considered the evidence about the reasonableness of Digicel's cost model assumptions.

As traffic volumes are derived from a multiple of subscriber numbers and MoUs, upward or downward adjustments to either or both of these inputs affects the time period to reach static efficiency and the level of the costs.

Upon cross-examination by TSTT, Digicel's expert witness, Mr. Grummit, acknowledged that Digicel's cost model assumed subscriber growth would continue through the first two years, achieving about 17% of the subscriber market at the end of those two years (Day 2, page 67).

The evidence provided to the panel by both Digicel and TSTT showed that the number of Digicel subscribers at mid-June 2006 (before the end of its first quarter of activity) was higher than the number assumed in the cost model for the end of the second year – and indeed the third. The actual number of Digicel subscribers exceeded 240,000 by mid-June 2006. The evidence before the panel shows that Digicel's actual subscriber numbers after its first quarter more than doubled what they were expected to be.

Digicel's interconnection specialist, Mr. Barrins, indicated under cross-examination that not every activated handset should necessarily count as a subscriber since Digicel was not sure to hold onto its initial subscribers and some continuity was required for assurance that the number was reliable (Day 1, pages 33-37). Nevertheless, Digicel did not contest the evidence that its subscriber growth far exceeded its expectations.

According to Digicel's cost model, the third mobile operator would enter the market in the fourth month of Digicel's operation (July 2006). Because of this, it would experience churn and growth would thereafter proceed at considerably lower rates than before.

However, the third mobile operator has not yet entered the market. Updated evidence provided to the panel showed that by the end of July 2006, Digicel's lead over its cost model assumptions had grown such that it had tripled the number of subscribers it had anticipated having by then. It had after four months of activity exceeded by nearly 50% the number of subscribers assumed for after nearly four years of activity.

Such figures, while impressive, do not tell the entire story, and the panel was careful not to be swept away by them. As stated previously, static efficiency relates to traffic volumes, of which subscriber numbers are but one factor alongside MoUs.

The parties presented evidence to the panel regarding the reasonableness of Digicel's assumption of its MoUs in its cost model. Digicel's expert witness Mr. Grummit compared Digicel's assumption of MoUs with usage numbers in various Latin American countries. On cross-examination, Mr. Grummit accepted that there was no particular significance in the choice of Latin American countries (Day 2, pages 71-73). TSTT, on the other hand,

submitted evidence to the panel of TSTT's MoUs recorded on TSTT's switches from April 2005 through March 2006. They far exceed the projected and actual recorded early MoUs of Digicel. They are the MoUs of an incumbent compared to a new entrant, however, and the panel accepted Digicel's arguments that a new entrant's MoUs can be expected to be lower than the incumbent's.

Indeed, the traffic evidence showed this to be the case. In fact, while TSTT's recorded MoUs were far higher than Digicel's assumption, Digicel's evidence provided to the panel and the Panel Expert showed that Digicel's recorded MoUs were significantly lower than Digicel's assumption. According to the Panel Expert's evidence, Digicel's recorded MoUs were so much lower than its assumption that they offset Digicel's underestimation of its growth in average subscribers.

The Panel Expert suggested Digicel's MoUs were lower than its assumption due to Digicel subscribers still having TSTT mobile phones. Digicel sought to explain by mathematical deduction, which it asked TSTT's expert witness Dr. Ros to conduct for it on cross-examination, that this would be mathematically inevitable if a significant number of its subscribers still held TSTT phones. Digicel also sought to explain by mathematical deduction that given the limited total number of potential subscribers in the market, it was an inescapable mathematical fact that a significant number of subscribers were indeed holding both Digicel and TSTT phones (Day 4, pages 30-37).

TSTT objected that Digicel provided no evidence of either of these suppositions. While it is difficult to be precise about these effects, the panel is persuaded that Digicel's recorded MoUs have been lower than projected in Digicel's cost model due to this phenomenon. The panel also finds that the cost model evidence provided confidentially by Digicel shows that Digicel's

recorded MoUs are lower than its assumed MoUs (and TSTT's recorded MoUs) in part because in its early period Digicel's ratio of pre-paid to post-paid subscribers has been higher than assumed as its average. The evidence confirms that Digicel's pre-paid users have a far lower usage rate than Digicel's post-paid users.

TSTT argued, however, that the two-phone-phenomenon and the low user customer base, neither of which it admitted, were likely to change. Subscribers would become comfortable with Digicel's service (and presumably drop their TSTT phones) and Digicel is likely to attract higher volume users. TSTT referred to evidence showing Digicel's successful performance in other Caribbean countries. Digicel countered this evidence with the argument that Trinidad and Tobago is very different from these other countries, particularly because the level of existing market penetration and incumbent advantage is far higher. Each party exchanged evidence regarding the marketing efforts the other was making.

The Panel Expert's evidence included its opinion on the reasonableness of Digicel's traffic inputs for calculating its mobile termination costs:

Digicel's traffic inputs used in the model match the figures observed to date. Furthermore these figures correspond to the predictions made by Digicel in its response to RFP. TERA's opinion is that Digicel's traffic inputs used in the model can be considered as reasonable reference for calculating its mobile termination rate, especially in the initial years of operation given the unpredictability of the market.

The Panel Expert did not state why it considered the correlation between the traffic predictions in the cost model and the license (response to RFP) application as supporting the reasonableness of the inputs. The panel finds it not unreasonable to suppose that the license application was untainted – or at least less tainted – by motives that may arise in a contentious situation such as the current dispute.

The correlation between the traffic assumed and the recorded traffic was based on Digicel's first two months of activity. Subscriber numbers grew very quickly in those two months, so the average for the period was very significantly below the number of subscribers at the end of the period. The multiple of the average subscribers and the average MoUs for that period was close to the multiple from Digicel's cost model. This was the offset described by the Panel Expert.

As mentioned above, the number of subscribers continued to grow after those first two months so that, after four months' activity, it was about triple Digicel's assumed level for that time. Digicel's MoUs declined further during the third and fourth months, but not to anything like the degree to which Digicel's subscribers increased in relation to the cost model assumptions. Even though Digicel's rate of growth of subscribers can reasonably be expected to decline, the number of subscribers is now so much higher than assumed in the cost model that, in calculating traffic volumes, even multiplied by the lower than expected MoUs, the picture is quite different. The subscriber numbers have stretched their lead so that now the (now slightly greater) overestimation of MoUs will no longer offset the (now far higher) underestimation of the subscriber number.

While the traffic volume in the first two months may have been in line with the

cost model, the panel finds that Digicel's traffic volumes are, going forward, reasonably likely to be well ahead of its assumptions.

There is insufficient information before the panel to assess whether the two-phone phenomenon if it exists will increase or decline, particularly with the introduction of termination charges, depending on their level. However, the panel does consider it reasonably likely that Digicel will capture an increasing proportion of the higher volume user market over time.

The panel considered Digicel's claim in its submissions that TSTT would be earning "supernormal profits", as well as the Panel Expert's report and the record of the cross-examination of the Panel Expert on this subject (19 July, pages 41-55). The panel finds that notwithstanding TSTT's higher subscriber numbers, it is unlikely that its cost of mobile termination is significantly lower than its TT\$0.45 (US 7.2 cents) charge, if at all. This charge is already a low rate in comparison to the NZCC 75th percentile average. Further, as previously mentioned, Digicel's contention is that TSTT's actual cost is considerably higher.

For these reasons and having weighed the evidence and arguments before it – including the Panel Expert's opinion of Digicel's traffic inputs and the unpredictability of the market – the panel considers it reasonable to expect Digicel will reach traffic volumes at a level of static efficiency more quickly than expected. The panel also finds that as a result, the Panel Expert's calculation of a TT\$0.56 (US 9 cents) per unit cost over the period to 2015 is reasonably likely to be on the high side, and that Digicel's average costs over such a period will be even closer to TSTT's.

Considering the Act's overall purposes, the panel recognizes that there may be circumstances in which the expeditious development of competition in a

given market is an overarching goal meriting a departure from the use of a single reciprocal charge based on the costs of an efficient steady state operator.

It may be appropriate in such cases to employ non-reciprocal charges for different operators, with the new entrant's charge being based on the costs of an operator operating as efficiently as it can given its phase of network development and operation.

A limited asymmetry for a temporary period may not be inappropriate in some cases. This could be carefully tailored to reduce over time, much as the NZCC provided for time-tiered reductions in assumed costs over years from the determined rate of TT\$0.57 (US 9.2 cents).

The panel considered these options and weighed the various goals of encouraging competition and investment, promoting economic efficiency and the benefits of reciprocal charging mentioned above in section 2.2(c) of this decision. While the panel found it to be a close case, the panel does not on balance believe that the situation requires or justifies the development and use of separate "efficient" costs based on the stage of network buildout and customer acquisition. In the circumstances of this case, the panel does not consider that the purposes of the Act would be frustrated if reciprocal charging is mandated in the Interconnection Agreement.

2.6 The retail market and non-discrimination

The parties appealed to the effects on the retail market, and concerns about non-discrimination obligations, and it is appropriate to touch on these before concluding.

The parties presented arguments about the broader implications of reciprocal or non-reciprocal charging and the charges proposed by the parties. On behalf of TSTT, Ms. Agard (TSTT's Vice President Legal Regulatory and Carrier Services) and NERA gave evidence that Digicel's proposed mobile termination charge would increase TSTT's costs for fixed-to-mobile calls and necessarily increase the retail prices for such calls. Digicel's proposed mobile termination charge is well in excess of TSTT's per minute fixed-to-mobile retail price, even taking into account a higher effective revenue resulting from per minute (as opposed to per second) billing. TSTT also argued that the increased costs from interconnection payments and resulting increased fixed retail prices would increase fixed-mobile substitution and starve TSTT's fixed division of revenue required to develop broadband access.

In his evidence, Digicel's witness Mr. Gunnigan described these concerns as "fanciful in the extreme", arguing that TSTT is free to differentiate between on-net and off-net mobile calls. He also gave evidence that the short average duration of fixed-to-mobile calls implies that there is unlikely to be a significant impact on the average price per minute, and that TSTT may already be pricing these services low to influence the panel's decision.

Even taking into account these possibilities, the panel finds that it is likely that a termination charge at Digicel's proposed rate would increase considerably TSTT's fixed-to-mobile retail price. This in itself could not, and did not, carry as much weight in the panel's considerations as the cost-based charging requirements of the Act and Concessions. However, it does illustrate the wisdom of the Act's approach in protecting consumers from excessive charging on what, as was determined earlier, are essentially monopoly services.

TSTT also argued that Digicel must not be allowed to charge a higher mobile termination charge than its retail prices of on-net calls. To the extent that the termination service may be viewed as a portion of a full originated and terminated call, in TSTT's submission, it is questionable that mobile termination can cost more than an entire on-net call. Mr. Barrins gave evidence that Digicel was pricing calls below cost as a means of gaining a foothold in the market in face of aggressive price cuts from TSTT. Digicel's witness Mr. Gunnigan argued that without dominant market power, Digicel's retail marketing strategy of special on-net tariffs should remain unregulated.

For its purposes here, the panel takes the primary thrust of TSTT's line of argument less as suggesting that Digicel's retail prices should be regulated and more that the retail price showed that Digicel's proposed mobile termination charge must be well above its costs. The parties' retail prices have varied considerably over the course of this proceeding, and will in all likelihood vary further as interconnection termination charges are introduced. The panel finds on the basis of the evidence before it – including the parties' advertising of their new retail rates – that a new entrant is likely to employ all sorts of retail pricing strategies. These may vary considerably as to how, and over what time period, it seeks to recover its costs. It is particularly difficult to form any conclusion at all from Digicel's retail prices about its cost of mobile termination.

Both parties argued that the other's position would have discriminatory effects. TSTT argued that non-reciprocal charging that allowed Digicel a higher rate would unfairly advantage Digicel. Digicel argued that under a reciprocal charge it would be prevented from recovering its costs while TSTT enjoyed profits and that this would be discriminatory. In the panel's opinion, the non-discrimination provisions of the Act are intended to prevent unfair treatment, particularly abuse of power, against other operators. They are not intended

to address the inevitable financial challenge facing a new entrant entering the market.

TSTT brought evidence that it entered into an interconnection agreement with the third mobile operator, Laqtel, on 26 May 2006. The record showed that the interconnection agreement provides for a reciprocal mobile termination charge of TT\$0.45 (US 7.2 cents) – the reciprocal charge TSTT proposed to Digicel. The terms accepted by Laqtel reflect TSTT's position in this dispute, against which Digicel is contending.

Various evidence was brought by both parties as to what the implications of this agreement were. TSTT suggested that the panel could infer that Laqtel is satisfied that it would not be providing mobile termination at a loss on the basis of such an agreement. Digicel expressed suspicion as to why Laqtel had entered into the agreement with TSTT. After all, Laqtel could be readily presumed to have a strong interest in awaiting the outcome of this dispute between TSTT and Digicel since it would likely benefit from the same treatment as Digicel received. TSTT also argued that obligations of non-discrimination made it difficult to see how it could pay a differential rate to Laqtel and Digicel.

The panel is perplexed as to why Laqtel would enter into an interconnection agreement on TSTT's preferred terms when this proceeding was well underway before the panel. There was, however, insufficient evidence before the panel to establish anything more than the reasonableness of Digicel's suspicion. In any event, the panel put no weight on the Laqtel agreement as a precedent or justification for TSTT's charge or reciprocal charging. In the panel's view, there is no meaningful evidence before it as to why Laqtel agreed with TSTT as it did, whether it did so as a "rational actor" as TSTT

suggests, what its costs are, when Laqtel will enter the market, or whether it will be commercially viable on the basis of such an agreement.

The panel disagrees with TSTT's argument that the Laqtel agreement prevents it offering Digicel better terms. Section 25(2) of the Telecommunications Act requires the Authority to require concessionaires to:

- (e) promptly negotiate, upon the request of another concessionaire ... an agreement with regard to the prices and the technical and other terms and conditions for the elements of interconnection;
- (f) deposit with the Authority a copy of any agreement concluded pursuant to paragraph (e) within twenty-eight days of its making;
- (g) offer the terms and conditions of an agreement concluded pursuant to paragraph (e) to any other concessionaire of a public telecommunications network or public telecommunications service on a non-discriminatory basis.

The panel does not find, in this or the other provisions of the Act and Concessions relating to non-discrimination, any reason why TSTT cannot offer more favourable terms to Digicel than it has already agreed with Laqtel. Concessionaires are not prevented from offering to revise existing agreements to improve the terms they previously agreed – particularly when the existing agreement is with an entity that is not operating. It is also perfectly arguable that non-reciprocal charges are not discriminatory so long

as an operator is charging its own termination at the same charge to all other operators.

The panel finds that TSTT would not be breaching its obligations of non-discrimination were it to enter into an interconnection agreement with Digicel providing for a higher mobile termination charge, whether reciprocal or non-reciprocal, for Digicel than TSTT agreed to pay Laqtel, or indeed any other terms that were more favourable to Digicel than were agreed with Laqtel.

2.7 Conclusion

On the totality of the evidence and submissions, and the factors described in this decision, the panel finds that it is not contrary to the Telecommunications Act, Concessions, Interconnection Regulations or Interconnection Guidelines for the Interconnection Agreement to provide that charges shall be reciprocal. The panel does not consider that TSTT is prevented from insisting on including in the Interconnection Agreement clauses 9.2 and 9.3 as quoted above in section 2.1 (except that, in the spirit of reciprocity, the second sentence of clause 9.2 should be reciprocal). Digicel's request in this regard is denied.

3. INTERIM INTERCONNECTION CHARGES

When this proceeding was initiated on 19 January 2006, interconnection had not been established between the two companies. Although the parties failed to reach an interconnection agreement in large part due to their failure to agree interconnection charges, the setting of long term charges was not referred to the panel. This was stated explicitly in Digicel's Reply to TSTT's Response.

Nevertheless, in order to ensure that the interconnection process was not delayed, Digicel requested in its original Complaint on 27 January 2006 that interim interconnection charges be put in place that may be adjusted retrospectively when the final rates have been put in place. Presumably the parties would negotiate in light of the panel's finding on reciprocal charging, and if they failed to agree on charges, another dispute proceeding would be initiated. In the meantime, at least they would be interconnected and exchanging payments. The panel's Terms of Reference for this dispute included this request of Digicel for interim interconnection charges.

Interconnection had still not been established on 24 March 2006, when Digicel filed an application with the panel informing it that Digicel planned to apply to the panel at the first hearing on 31 March 2006 to set interim interconnection charges. At that hearing, the panel heard arguments from the parties concerning this application.

The panel found that it did not have sufficient information about what charges might be set, or whether there was sufficient urgency to require an interim measure. Because there did seem to be some urgency about the matter, the panel instead directed a two week procedure whereby the parties would make

submissions enabling the panel to hear and consider Digicel's application properly. Trinidad and Tobago was at that time without a second mobile operator and Digicel's investment was lying idle due to the failure to reach an interconnection agreement. The panel also provided for a sender-keeps-all arrangement to apply from 31 March 2006 so that, if Digicel wished, it could commence business.

The parties thereafter activated interconnection, Digicel commenced business and, according to the evidence before the panel, interconnection has continued on a sender-keeps-all basis.

The panel's jurisdiction with respect to Digicel's application was challenged before Justice Gobin of the High Court in judicial review. Justice Gobin decided that the panel did not have jurisdiction. The panel therefore did not proceed to hear Digicel's application under the procedure it had directed on 31 March 2006.

Digicel maintains its request to the panel to set interim interconnection charges in this, the panel's final decision. Both parties have made arguments to the panel about the panel's jurisdiction to do so.

In this context, it is worth recalling the terms of the application itself. Digicel's original request was that interim charges be put in place in order to allow it to begin business. The evidence is clear that Digicel has now been interconnected for more than four months, making rapid strides into the Trinidad and Tobago market. The basis of Digicel's request and evidence regarding it shifted to the adverse financial impact of the sender-keeps-all regime while in business. Digicel led evidence through Mr. Barrins to the effect that it faces tremendous financial problems if interconnection charges

are not set.

The panel found in section 2 a reasonable range of the costs of an efficient mobile operator in Trinidad and Tobago and that reciprocal charging can apply. This range is considerably narrower than the gap between the parties' positions prior to this decision. Negotiations can now be expected to proceed much more quickly on the basis of that range. Setting interim charges at this time would, in the panel's view, unnecessarily interfere with those negotiations – and could even delay the resolution of interconnection charges.

With respect to the parties' submissions on the panel's jurisdiction, it is not clear that panels acting under the Authority's dispute resolution mandate in section 82 of the Act cannot make findings or take decisions that would have effect on a provisional basis pending the occurrence of a later event. In the case before the panel, however, even if it has jurisdiction, the panel finds that it would not set interim interconnection charges for the reasons set forth above.

4. ACCESS DEFICIT CHARGES

4.1 Digicel's request

In negotiation of the Interconnection Agreement, TSTT proposes that it provide for the possibility that the Authority may prescribe an Access Deficit Charge ("ADC"). Digicel opposes any reference to ADCs in the Interconnection Agreement.

The draft Interconnection Agreement provided for an exception to the proposed reciprocal charging. The full version of clause 9.2 and clause 10.2 provide as follows (emphasis added):

9.2 *With the exception of any Access Deficit Charge prescribed by the Authority that TSTT is permitted to charge, unless otherwise stated, Charges payable by TSTT to the Telco for a Service shall be the same as the Charges payable by the Telco to TSTT for the same Service. In the event that TSTT's Charges for a Service are varied pursuant to Clause 10, the Telco will vary its Charges for the same Service to ensure they remain the same. The Charges payable by TSTT to the Telco in respect of a Service shall not include an Access Deficit Contribution.*

[...]

10.2 For greater certainty, where the Authority

prescribes an Access Deficit Charge, TSTT may vary the Charges in this Agreement to include such Charge.

4.2 The arguments of the parties

Digicel's main line of argument, presented by its expert consultants DotEcon, was that ADCs are bad regulatory policy, as can be seen from Europe where they are not permitted because they are detrimental to competition and create a disincentive to investment. There is no evidence, according to DotEcon, that an access deficit even exists in Trinidad and Tobago. If it does, dealing with it by rebalancing retail prices would be far less distortionary than imposing additional charges at the interconnection level which have no relevance to mobile-to-fixed interconnection. Without such retail price rebalancing, any access deficit that exists should be dealt with in the context of universal services.

DotEcon's evidence stated that European countries took the approach that net costs of access deficits should be met through universal service funding. The most prominent example of use of ADCs in Europe had been in the UK, where it had been half-hearted and was discontinued in 1994.

TSTT argued that an access deficit does exist as a result of policies emanating from the period prior to liberalisation; local access charges were regulated at a low level "in order to encourage universality of service", as TSTT put it. This necessitated the cross-subsidisation of below-cost local access rates through the charging of above-cost rates for other services, historically international/long distance.

TSTT brought evidence through its witness Ms. Neil regarding how it

calculates the access deficit. Ms. Neil's evidence stated that the access deficit was calculated as the difference between the revenue earned from providing fixed access lines and the cost of providing and maintaining these lines. The result showed that the revenue is less than the cost. TSTT's experts NERA gave evidence that this method of calculation was fairly consistent with the approach NERA had recommended to TSTT and applied in previous studies.

TSTT argued that the access deficit would have serious adverse impacts in a competitive market because the profitable services which cross-subsidised the deficit would come under competitive pressure, reducing or eliminating the available subsidy. This would impoverish the local access network precisely at a time when government policy was to prioritise broadband penetration throughout the economy. The continuing access deficit would also preclude competition in local access because access was being provided below cost. Thus, it is necessary to address the deficit one way or another.

TSTT agreed with Digicel, and NERA gave supporting evidence from economic theory, that rebalancing prices is the preferable means to eliminate an access deficit. TSTT's witness Ms. Agard gave evidence that TSTT had written to the Authority on 5 December 2005 to begin the dialogue on this, but had heard no positive response. TSTT believed it necessary to provide for the possibility of an ADC in case price rebalancing is not implemented. No universal service fund had yet been specified by the Authority under Section A15 of the Concession, so TSTT could not rely on this to fund the deficit.

NERA gave evidence that in the absence of price rebalancing or a neutral access deficit fund, it would be economically reasonable to require all participants – incumbents and competitive providers – to pay to fund the access deficit. Imposing ADCs would put all operators on an equal

competitive footing and ensure that competitive outcomes are determined on the basis of relative efficiencies and not asymmetric regulation, i.e., placing a greater burden on TSTT. Furthermore, according to NERA's evidence, ADCs had not entirely been abandoned internationally. For example, some small, high-cost local exchange operators in the United States charged long distance carriers interconnection rates above cost, in effect providing funds to support lower rates for basic access.

TSTT argued – and in the panel's view this was its most important argument – that it would be inappropriate to exclude the possibility that Digicel may be required to pay an ADC if approved by the Authority. The clause in the Interconnection Agreement does not state that an ADC will ever be imposed. It simply makes provision for the possibility that the Authority may approve an ADC, in which case TSTT should be able to vary its charges in the Interconnection Agreement to include it. It would be inappropriate to exclude the possibility of Digicel paying an ADC prior to the Authority making a final determination on whether or not it will approve an ADC.

4.3 Must ADCs be ruled out of the Interconnection Agreement?

The panel agrees with TSTT that its proposed clause in the Interconnection Agreement does not mandate the imposition of ADCs, but provides for ADCs only in the event that the Authority prescribes them. TSTT did not argue in favour of ADCs in this proceeding. It argued that they should not be taken off the table in case other, preferable solutions are not employed.

In effect, TSTT's argument is that the panel need not take a position on whether ADCs should be used. Rather, it should simply acknowledge that the proper decision-maker, the Authority, should make that decision, and that it

has discretion to prescribe ADCs.

The panel does not consider it necessary for the purposes of the matter before it to reach a determination on TSTT's evidence that it has an access deficit. TSTT's evidence is that it has, and the panel agrees this must be addressed by the Authority. In the panel's view, however, whether the Interconnection Agreement may provide for ADCs depends upon whether an ADC would be permissible in the first place. If it is permissible, then it is hard to disagree with TSTT's wish to make provision for it in the Interconnection Agreement in case the Authority decides to prescribe an ADC. However, if ADCs are impermissible under the Telecommunications Act and the rest of the regulatory framework, then it would not be appropriate for the Interconnection Agreement to provide for the possibility of the Authority prescribing them.

The provisions of the Act and Concessions regarding interconnection charges have been set out in section 2.2 of this decision. Section 25(2)(m) of the Act, as reflected in section 14 of Schedule H to the Concessions, provides for charges for interconnection to be based on costs. Section 24(1)(c) of the Act, reflected in section C of the Concessions, prohibits cross-subsidisation of networks or services without the Authority's prior written approval. The Authority can give its "approval" for cross-subsidisation under section 24(1)(c), but there is no mention of the Authority having the power to mandate that one operator's service or network cross-subsidise another's, even for legitimate reasons of public policy such as maintaining below-cost retail access prices.

The Telecommunications Act also addresses cross-subsidisation in section 29(2):

The Authority may establish price regulation regimes, which may include setting, reviewing and approving prices, in any case where [...]

(b) a concessionaire operating a public telecommunications network or providing a public telecommunications service cross-subsidises another telecommunications service provided by such concessionaire.

It is clear from the context of the rest of section 29(2), all of section 29 and the spirit of the Act that this provision is aimed at addressing problems of dominance and anti-competitive cross-subsidisation by an operator of its own networks and services. Section 29(2)(b) does not suggest that the Authority has a power to adjust interconnection charges upwards above cost, or add supplemental charges on top of cost-based charges, in order to subsidise services of other operators.

In the panel's opinion, the combination of these provisions, taken in the context of the overall approach of the Act to establishing a modern, competitive, efficient regulatory regime and telecommunications sector, reflect an intention to minimize distortions between the charges and costs of services. The Act and Concessions leave little room for adding a supplemental charge on top of a charge that is already supposed to be based on costs. Calling it an "ADC" would not change the reality that the charge was being applied in respect of interconnection services.

In the panel's opinion, then, the Telecommunications Act and Concessions do not provide for the possibility of ADCs. This is reinforced by the finding that there are two solutions permissible within the regulatory framework to deal

with access deficit problems. First, powers over retail price regulation are set out in section 29 of the Act, which may be used as guided in that section and by the objects of the Act. Secondly, the Act explicitly provides for regulatory policy to encourage universality of service. Section 28 of the Act provides:

- (1) In accordance with the policy established by the Minister, the Authority shall determine the public telecommunications services in respect of which the requirement of universal service shall apply.
- (2) Such services, as are referred to in subsection (1), shall include, at a minimum, a quality public telephone service.
- (3) In accordance with the policy established by the Minister, the Authority shall periodically determine the manner in which a public telecommunications service or value added service shall be provided and funded in order to meet the requirements of universal service for that service, including the obligations, if any, of the providers and users of the service.
- (4) The Authority may, with the approval of the Minister, require that closed user group services, private telecommunications services and value added services as well as the users of such services and all telecommunications services generally, contribute to the funding of universal service.

[...]

(8) The obligations to provide and contribute to the funding of the services referred to in subsection (1) shall be applied on a non-discriminatory basis as between all similarly situated telecommunications service providers and users.

Implementing this, section A15 of the Concessions provides for concessionaires of broadcasting services and public domestic mobile, public domestic fixed, and/or public international telecommunications networks and services to remit an amount no greater than 3% of gross annual revenues as may be specified by the Authority to a universal service fund. Thus the mechanics for funding the costs of universal service goals are already there. It is for the Authority and the Minister to consider how and whether to use those mechanics in respect of deficits caused by any price regulation that exists to advance universal service goals.

This conclusion from reviewing the Act and the Concessions is further reinforced by the strong advantage that universal service funding would have over ADCs. The evidence shows that ADCs have been, and in some cases still are, used in some countries to deal with access deficits. The panel finds, however, that while ADCs may not have been entirely abandoned internationally, there are good reasons to avoid them.

ADCs are distortionary and may even result in entrenching any access deficit that may exist. The panel finds also that there are specific disadvantages to using bilateral contracts between private companies as the mechanism for funding a subsidy to an operator for the purposes of achieving a broader public policy goal. The Interconnection Agreement between the parties to

this proceeding is already the subject of sharp discord even before it has been signed. Including in it a highly contentious element such as an ADC seems likely only to increase the scope for disputes between the contracting parties in question. Multiplying this across the sector in other interconnection agreements would only spread this risk further.

Both parties are agreed that the optimal approach would be to eliminate any access deficit that may exist through price rebalancing. Were this to be introduced so slowly and the access deficit to be so great that some ongoing subsidy is determined by the appropriate authority to be required, the transition would be better managed under a centrally controlled fund than by entrenching the ADCs in contractual obligations between operators.

4.4 Conclusion

That the powers under the Act have not been used until today to address any access deficit that may exist does not entitle TSTT to a solution which is not provided for in the Act, for which powers are lacking and which would run against the spirit of the Act. Having considered the evidence of the parties and their arguments, the panel finds that the Interconnection Agreement may not provide for the possibility of an ADC. Digicel's request is granted.

5. OTHER SERVICES

The parties' failure to conclude an interconnection agreement included a difference of view regarding the services it should cover. Digicel submitted that freephone services, international telephony and short message services ("SMS") should be included in the agreement. TSTT disagreed. According to the parties' submissions, TSTT and Digicel subsequently agreed during the course of this proceeding to include international incoming services in the Interconnection Agreement so that it need not be addressed. Therefore that leaves freephone (national and international), international outgoing telephony and SMS services at issue.

5.1 Are the services subject to interconnection obligations?

(a) "Wholesale" versus "interconnection"

Digicel argued that freephone, international outgoing telephony and SMS services are all "interconnection" services and so should be included in the Interconnection Agreement. TSTT argued that the services in question are not "interconnection" but "wholesale" services. According to TSTT's submission, it is beyond the Authority's jurisdiction (and therefore that of the panel) to order the inclusion in an interconnection agreement of services that are not interconnection services. Therefore the panel may not find that they should be included in the Interconnection Agreement.

Section 2 of the Telecommunications Act defines "interconnection":

"interconnection" means the linking of public telecommunications networks and public telecommunications services, to allow the users of one

provider of a public telecommunications service to communicate with the users of another provider of a public telecommunications service, and to access the services provided by such other provider.

TSTT did not elaborate on its notion of wholesale services, or the basis on which it proposed the distinction between “wholesale” and “interconnection” services. The word “wholesale” barely appears in the regulatory framework. Schedule F of the parties’ Concessions addresses quality of service in respect of “Wholesale and interconnection” services without indicating whether these are mutually exclusive terms. Section A23 of the Concessions refers to fixed and mobile traffic termination services as “Wholesale telecommunications services”, notwithstanding that there is no question but that they are also interconnection services. To the extent this offers guidance, therefore, the meanings cannot be mutually exclusive.

The panel finds this view to be consistent with common usage of the term “wholesale”, which is customarily used in contrast to “retail”. “Wholesale” services involve the wholesaler providing services in large quantities to the retailer for onward “retail” sale to consumers in smaller quantities. Interconnection concerns the linking of the networks and services for the purposes of the service provided. The inclusion of the phrase “...and to access the services provided by such other provider” at the end of the definition of “interconnection” suggests that the Act intends the interconnection provisions to apply in respect of wholesale services.

The panel therefore disagrees with TSTT’s distinction between interconnection and wholesale services. With respect to the services concerned, the linking of Digicel’s networks and services with TSTT’s to allow

each other's users to communicate, or to allow Digicel's users to access TSTT's services, would be "interconnection" under the Act.

(b) Are SMS services "telecommunications services"?

With respect to SMS services, TSTT argued that SMS services are not "telecommunications services" within the definition of the Act and so are not a matter for interconnection. The Act provides the following definition in section 2:

"telecommunications service" means a service using telecommunications whereby one user can communicate with any other user in real time, regardless of the technology used to provide such a service and includes a public telecommunications service, a private telecommunications service, a closed user group service and a radio communication service".

TSTT argued that SMS services are not "real time" services and therefore are not within the definition. In TSTT's submission, SMS services are not real time services because SMS messages are not delivered instantly to the recipient. Various elements underline this. If the recipient's phone is switched off or disconnected, or if the network is congested, there may be extensive delay before an SMS message is received. If it is not received or is delayed, the sender does not have to resend it, which is characteristic of real time communication. In TSTT's submission, SMS services also do not offer the feature of interaction associated with real time communications, where a person can interrupt the other and respond. TSTT also argued that SMS

users cannot send SMS messages to fixed telephone users and are restricted to users of digital mobile services.

Digicel argued that the path of SMS message transmission is virtually instantaneous through the short message service centre (SMSC) to the recipient's phone. Thus it can be delivered in real time. This is borne out by the definition of "telecommunications" in section 2 of the Act, which includes "the transmission, emission or reception of signals, writing, pulses, images, sounds or other intelligence of any kind by ... radio ... electromagnetic spectrum or by way of any other technology."

According to the Act's definition, whether SMS services are "telecommunications services" depends upon whether they are services "whereby one user can communicate with any other user in real time..." In the panel's opinion, if it were possible for SMS services to be used for such communication when functioning effectively, then the fact that they sometimes do not – due to congestion or phones being switched off – would not be relevant. As Mr. Gunnigan's evidence noted, SMS services can now be provided on fixed line telephones, but even if TSTT were correct and they could not, this would not matter so long as there is a technology on which they do permit a user to communicate with another in real time.

The phrase "real time" may be viewed from its traditional computer technology perspective. This relates to whether the technology responds rapidly enough to input signals to ensure that the operation it is performing keeps going at the speed given its function. Anti-lock braking systems on cars are sometimes referred to as an example. If the system does not react to release the brakes in time to avoid the wheels locking, the function for which the system is used would fail.

In the panel's view, given that the Act aspires to provide a modern regulatory environment, traditional, technology-originated meanings of "real time" would have to be considered in the context of the rapid changes occurring in the telecommunications sector. Traditionally, services such as voice over circuit switched networks were considered real time services, while services such as data over store-and-forward networks (packet networks) were considered non-real time. However, the use of Internet Protocol technologies today involves the store-and-forward of packets of data, yet these can be used for live voice communications (voice over IP, or "VoIP"), which are certainly "real time". Like SMS services which may be sometimes degraded due to network congestion rendering them not immediate or real time, VoIP services are also subjected to similar network degradations rendering it less than satisfactory during a portion of the real time voice conversation. Thus the technological meaning of the phrase in the context of telecommunications has become blurred.

Furthermore, the Act did not provide a technological definition of "real time". Given the way in which traditional definitions may blur with rapid technological change, the Act wisely provided that the definition of telecommunications services should be considered "regardless of the technology used to provide the service". Whether SMS services use a store-and-forward or other technology is not relevant if users can employ the service to communicate in real time.

In the panel's opinion, the definition of "telecommunications service" in the Act is user-centric – it is concerned with the user's ability to communicate in a particular fashion, the way the user employs the service, the user's experience and expectations from it.

In well provisioned networks, SMS services are instantaneous for all intents and purposes as far as the experience of the ordinary user is concerned. Users sometimes rely upon instant delivery of the message. Obvious examples include communicating shopping instructions to a recipient user who is in the grocery store, or communicating directions to a recipient user on her way to a meeting. SMS services are also commonly used for conversations in which numerous messages may be exchanged over a period of a few minutes. In these situations, the user expects the service to react within the time required for the function for which it is used – which is immediate.

A user relying on SMS services for this interactive purpose may, if he or she does not generate the immediate reaction required from the recipient, follow up with a phone call. Phone and SMS services may not be substitutable in terms of defining markets for regulation, but a user may elect one or the other when it comes to communicating information that is intended to be communicated immediately.

This is also consistent with retail marketing usage of the phrase “real time”. Companies offer real time SMS news and sports updates, real time SMS stock and currency market quotations, real time SMS traffic alerts, and real time voting, for example participating in television show events. These services are marketed as ensuring that the user is kept up-to-date, current, able to react – as and when he needs – to the information as it becomes available. The mobility intrinsic to the mobile phone reinforces this as it means that SMS messages can be (even if they are not necessarily every time) delivered to the user instantaneously no matter where she may be.

For these reasons, the panel finds that SMS services can be used – even if they are not always so used – for real time communication and so are

“telecommunications services”. As they are offered to the public, they are “public telecommunications services”, making them services to which the interconnection provisions of the Act and Concessions apply.

5.2 Should the services be included in the Interconnection Agreement?

Digicel argued that all of the services concerned are included in RIOs as a matter of standard international practice and that therefore they should be included in the Interconnection Agreement. The evidence of its expert Mr. Tott of Klarus Consulting was that freephone services, national and international, are included as an integral part of standard interconnection services, and that this is convention and common practice. He gave British Telecom's RIO as an example. Mr. Tott also gave evidence that outgoing international telephony services are included in all RIOs, using British Telecom and Irish operator Eircom as examples.

TSTT brought evidence through Mr. McNaughton, Cable & Wireless (Caribbean)'s Executive Vice-President, Carrier Services. Mr. McNaughton gave evidence of the advantages and disadvantages of three primary ways in which the exchange of SMS messages can be facilitated between operators. These include via signalling links used exclusively for exchange of SMS between the operators, via a third party clearing house by commercial agreement with a third party carrier, or via Internet Protocol across the Internet.

Mr. Tott acknowledged that there are various ways to provide for SMS exchange but stated that in his view, irrespective of the physical means of SMS message delivery, it would be in line with convention and common practice for SMS services to be included as part of TSTT's basket of interconnection services. Mr. Tott also gave evidence that SMS services

are legitimate inter-operator carrier services and are treated as such by GSM operators and incumbents. He referred again to British Telecom, which offers Transit Short Message services in its RIO. The relevance of British Telecom offering an SMS transit service was not explained.

Mr. Gunnigan gave evidence for Digicel that mobile operators typically offered SMS interconnection in the same way as voice termination was supplied. Mr. Gunnigan's evidence was that there are significant disadvantages to exchanging SMS messages via a third party clearing house because that third party would add an extra cost to the service for its termination agreements with both parties. It would "make more sense from a financial perspective" for SMSs to be included in the Interconnection Agreement. He conceded on cross-examination, however, that SMS termination has typically not been regulated.

Mr. Barrins gave evidence for Digicel that SMS services were an integral part of its domestic mobile services. Digicel had received complaints about SMS messages from Digicel to TSTT which had been subject to a major failure on a day when on-net SMS messages on Digicel's network were satisfactory. Mr. Barrins also gave evidence that one of TSTT's proposals for handling SMSs, that they be carried across the public Internet, was acceptable to Digicel.

Apart from the arguments concerning definitions and jurisdiction above, TSTT's overall line of argument boiled down in the panel's view to the position that for various reasons it was simply not necessary to provide for these services in the Interconnection Agreement.

According to TSTT, the primary issue in respect of all of the services in question was the commercial terms and conditions for the services. These

could be negotiated between the parties, and such negotiations need not be subject to the interconnection regulatory framework – and therefore did not require to be included in the Interconnection Agreement. For example, with regard to international outgoing telephony and international freephone, TSTT would have an incentive to offer competitive terms and conditions since Digicel and others could provide the service over their own facilities. Furthermore, there are alternatives to including them in the Interconnection Agreement, argued TSTT. Digicel could self-provision international outgoing and international freephone services since its Concession gave it the right to do so. There was no reason then to require TSTT to provide them to Digicel. With regard to SMS services, alternative means of dealing with SMS exchange were available so it was unnecessary to subject them to the Interconnection Agreement.

(a) Should the parties be left to negotiate commercial terms?

TSTT's argument that the services can be commercially negotiated would apply to any service. It would apply to fixed termination services, mobile termination services and others over which there is no doubt but that the services should be included in the Interconnection Agreement.

In the panel's opinion, section 25 and the overall framework of the Act indicate a general preference for operators to reach their agreements and find solutions to their problems through commercial negotiation with one another. The Act intervenes in the case of interconnection, as well as access to facilities, to ensure that operators have assured access on reasonable terms and conditions to each other's networks and services. This purpose is all the more important where there are reasons to think in advance that such negotiations may involve such unbalanced bargaining strengths that intervention is necessary to ensure that fair terms are assured on a

sufficiently prompt basis. The underlying object is to ensure that operators interconnect effectively to enable them to provide services to their users on a basis that advances competition.

Where there are reasonable prospects that commercial negotiation can achieve interconnection promptly on terms and conditions that are fair, it might be appropriate to apply the provisions of the Act light-handedly. This would be all the more likely to the extent that one operator's position in the market and another's dependence on the agreement do not create a significant disequilibrium in bargaining strengths.

TSTT's argument that the parties should be left to negotiate outside the interconnection framework might have some force if there was reason on balance to think that commercial negotiations would be fair and succeed.

If it were so straightforward for the parties to negotiate commercial terms and conditions for these services, it is unlikely that we would be where we are today. The submissions are replete with evidence of the difficulty the parties have experienced in negotiating. The parties have not reached agreement on how the services in question here should be provided. No evidence has been submitted to the panel that TSTT has offered such services to Digicel on a basis that is acceptable to Digicel – or indeed on any basis at all. There is little reason to think that the parties would reach agreement, or at least that Digicel would not be at a considerable disadvantage in such negotiations since TSTT controls the facilities involved.

Digicel does indeed have the right under its Concession to build its own international infrastructure and establish the contractual arrangements necessary to self-provision international outgoing telephony and international freephone. Notwithstanding this, as discussed below, the panel considers

that unless and until it does so or a competitive market has developed in these services, it will be considerably disadvantaged in negotiations with TSTT. With respect to SMS and national freephone, Digicel would be just as, if not more dependent on TSTT's agreement.

A commercially negotiated agreement as proposed by TSTT for any of these services would likely need to include provisions necessary to prevent service problems such as referred to by Mr. Barrins in connection with SMS services. Such an agreement could easily enough be expected to become complex and its negotiation just as difficult as the Interconnection Agreement. In fact, the commercial agreement that would result would be no less an "interconnection" agreement just because the services were included in a document other than TSTT's RIO or the parties' principal Interconnection Agreement.

In the circumstances before the panel, excluding any of the services from the Interconnection Agreement just because they can be commercially negotiated on some other basis can only be expected to prolong the failure to reach agreement, risk unbalanced terms, or sow the seeds for future problems. The panel would have failed in its primary duty if this were its only basis for such a decision.

(b) Are there viable alternatives to interconnection?

In the panel's opinion, the obligation of a concessionaire to interconnect with another concessionaire is not an absolute one applying to every service in every circumstance. The definition of "interconnection" is a broad one, but the obligations to which it gives rise must be considered in relation to how essential the interconnection is and the effect on the provider's incentives to invest.

With respect to SMS services, TSTT did not show why the agreed fact that different technologies may be employed would mean the mutually preferred arrangement (which the evidence shows to be to transit SMS messages across the public Internet) should not be governed by the Interconnection Agreement. Nor did TSTT submit in this proceeding an alternative to Digicel's proposed service description in the event that the panel found that SMS services should be included in the Interconnection Agreement.

With respect to national freephone and SMS services, the panel finds that the nature of the parties' bargaining strengths and particularly their negotiating history require these services to be governed by a suitable agreement with sufficient protections for service level and quality. The Interconnection Agreement is the only framework before the panel and accordingly the panel finds that it should be used for these services just as it is for other services whereby Digicel's customers communicate with TSTT's.

In light of the statutory and policy framework of the Telecommunications Act, the panel believes that additional considerations must be taken into account where Digicel can self-provision services, i.e., with respect to international freephone and international outgoing telephony. The element in the definition of interconnection that refers to allowing users of one provider of a public telecommunications service "to access the services provided by such other provider" is, in the panel's reading, qualitatively different from the rest of the definition. It must be applied with particular attention to other underlying policies of the Act, not just that regarding interconnection.

The emphasis on the Act's goal of developing competition has been discussed in section 2 of this decision. The Act also refers in section 3(f) to the goal of "promoting the telecommunications industry in Trinidad and

Tobago by encouraging investment in, and the use of, infrastructure...”

The fault line between the parties’ arguments illuminates the underlying issue, which is how best to apply these goals of the Act.

On the one hand is the goal of encouraging investment and competition at the infrastructure level where economically feasible. It is necessary to consider operators’ incentives to build out their own infrastructure instead of relying upon that of the incumbent.

On the other hand is the object of encouraging competition in services at the level of service provision, which may be accelerated by encouraging resale of an incumbent’s services. In addition to this, it is reasonable to interpret the interconnection regime under the Act and Concessions, including its scope and reciprocal structure, as seeking to ensure that operators, including a new entrant facing a well penetrated market, can offer a reasonably comprehensive range of services.

Digicel’s counter-argument in its Reply to TSTT’s Response regarding its ability to self-provision was that it is simply unrealistic for it to replicate these services exactly in the immediate term. In order to replicate them, Digicel would have to establish infrastructure to the coast and link with an international partner. In addition, to establish its own international freephone services would take considerable time. TSTT did not offer substantive arguments against this argument.

Digicel is authorised under its Concession to operate a public international telecommunications network and to provide any telecommunications service on it. The panel believes it is reasonable to expect Digicel’s business case for constructing an international telecommunications network to differ from

TSTT's. At the domestic level, Digicel only operates (and is only licensed to operate) a domestic mobile network and provide services on it. TSTT operates a fixed network and provides services to customers on it in addition to its mobile network. Digicel may be able to generate international call revenue from fixed line customers at such time as carrier pre-selection may be introduced for international services but until then it will rely only on its mobile customers for international outgoing traffic.

In the panel's view, building infrastructure and commercial arrangements can be expected to take time. At this stage of Digicel's life, the panel's view is that ensuring that Digicel can offer these services to its customers and that competition develops as rapidly as possible requires international freephone and international outgoing services to be included in the Interconnection Agreement.

TSTT disputes the inclusion of national freephone services apparently due to commercial disagreement on the pricing arrangements. According to TSTT's submission, the disagreement centres around "the legacy arrangements whereby 800 fixed-line freephone customers pay the same charge for receiving calls regardless of whether the call originated from a fixed line or mobile phone, while the calling party (fixed or mobile) that originated the call pays no charge". TSTT submitted that it has made a proposal to Digicel to "provide transit to TSTT's 800 fixed-line customers at no charge to Digicel in order to facilitate the placing of calls from any mobile calling party to 800 fixed-line customers without disrupting existing legacy arrangements."

The panel does not consider this to be a valid reason to exclude national freephone services from the Interconnection Agreement since it does not alter the nature of the service. Unless there are competitive wholesale providers of freephone numbers to which Digicel can connect, providing its customers

with comprehensive access to freephone numbers, interconnection is required to enable such communication to happen.

Furthermore, TSTT has not shown whether its proposal to Digicel will enable Digicel to recover the cost of origination of the calls. TSTT stated that it has submitted a service description outlining the terms and conditions under which national freephone services can be provided. Such submission was not made in this dispute proceeding, however, and the only service description before the panel is that proposed by Digicel.

(c) Conclusion

For the reasons set forth above in respect of each service, Digicel's request is granted in accordance with its terms with respect to the inclusion in the Interconnection Agreement of: national freephone; SMS services (except with respect to charging of SMS services which are discussed in section 6); international freephone (on a wholesale basis) and outgoing international telephony (on a wholesale basis).

6. SMS CHARGES

Digicel initially requested that the principle for pricing of SMS termination charges be determined as the same as for voice termination so that charges be asymmetric. Digicel's argument appeared to the panel to be intended to follow on the coat tails of its argument for non-reciprocal, cost-based mobile termination rates for voice calls, as addressed above in section 2. TSTT argued that since, according to its earlier argument SMS services are not an interconnection service, their pricing principle should not be determined by the panel. The panel disagreed with TSTT on that point and so it now proceeds to consider the issue of SMS charges.

Mr. Gunnigan gave evidence, citing France as an example of a regulatory initiative in respect of SMS charges, and referring to the October 2005 report of French regulator ARCEP. Mr. Gunnigan's evidence was that it was likely that regulation of SMS termination charges would be introduced internationally and that it would result in the emergence of asymmetric rates. Under cross-examination, Mr. Gunnigan conceded that France was unusual in even considering regulating SMS charges and had not yet decided to do so (Day 1, pages 17-18). The panel observes, nevertheless, that subsequent to the report to which Mr. Gunnigan referred, ARCEP has published a Relevant Market Analysis of the SMS market (available on the ARCEP website). In its February 2006 report, ARCEP concluded that since mobile operators have monopolies on SMS termination, it was necessary to regulate SMS termination charges. Indeed, it concluded that SMS termination costs were about 2.5 euro cents per SMS in metropolitan France.

This, however, is the only information before the panel about the cost of SMS termination charges. The panel finds that the evidence shows that despite

the French regulator's initiative to regulate SMS termination charges, it is indeed unusual in this respect. No evidence of any substance was submitted by the parties in respect of SMS charges, whether there should even be SMS termination charges, if so what they should be, or what the implications of reciprocal or asymmetric charging would be. Given also that the panel has declined to find that charges should be asymmetric in the context of voice termination, the panel does not find that charges for SMS termination must be asymmetric and denies Digicel's request in this regard. The panel does not consider it necessary at this stage of the market in Trinidad and Tobago to state more than the obvious: agreement between the parties to charge one another for SMS termination would be subject to the Act's and Concessions' interconnection provisions, including cost-based charging.

7. ADVANCE PROVISION OF WHOLESALE SERVICES UNDERLYING NEW RETAIL SERVICES

The parties disagreed over section 42.1 of their draft Interconnection Agreement. In the draft provided to the panel with Digicel's Complaint, section 42.1 provides:

Where TSTT introduces a new retail service which [Digicel] may wish to provide to its customers, TSTT shall provide any underlying interconnection service necessary to provide that retail service by the date the retail service is first made available to a customer. However, this obligation will only apply where there is objectively verifiable market based demand for the underlying interconnection service.

Digicel requested that TSTT be required to offer Digicel new fixed interconnection services that underlie TSTT's fixed line retail services three months in advance of the launch of the retail services until TSTT faces significant competition in the fixed line market place. According to Digicel, this was required to enable Digicel to launch a competing service at the same time as TSTT. While TSTT faces competition in mobile services, it will remain dominant in fixed services for some time. The requirement will not be necessary, according to Digicel, when significant competition exists in fixed line provision.

TSTT argued that section 42.1 should either remain as it is, or it should be reciprocal. Both parties should rely upon TSTT's Carrier Services Department to keep confidential any information related to proposed retail services of

either company. TSTT also argued that there is no risk of any fixed retail service posing any form of substantial competitive threat to mobile operators.

Digicel's request was not as clear as one might wish. The panel understands Digicel to be referring to fixed retail services which TSTT already provides or is launching, and is preparing to launch in the mobile sector with which Digicel competes. There is no other intelligible interpretation of Digicel's request since the level of competition between Digicel, a mobile operator, and TSTT's fixed line service is low compared to its competition with TSTT's mobile services. The panel finds it difficult to interpret (as TSTT appears to have done) Digicel's request in relation to the launch of fixed line retail services and not the launch of mobile retail services which TSTT already provides on a fixed retail basis. This is consistent with the evidence of the parties' experts which addressed access to TSTT's wholesale services on a general basis.

DotEcon and NERA exchanged views in their evidence. The former's evidence was that access to TSTT's wholesale services was important to a new entrant's ability to compete. Notwithstanding DotEcon's copious examples of European and other international regulatory practice in other matters in dispute, they did not volunteer any examples of advance notice of new retail services and advance provision of wholesale services underlying them. NERA's evidence was that providing notice and access to wholesale automatically – in any cases other than those that are essential for competition – would harm TSTT's incentive to invest and innovate. Dynamic efficiency would suffer as a consequence.

The panel agrees with Digicel that so long as TSTT does not face effective competition in the fixed line market, Digicel will likely depend upon TSTT for wholesale services for some of its retail services. The panel agrees that when TSTT introduces such new retail services and Digicel also wishes to offer

them but relies on TSTT's underlying fixed wholesale service, Digicel will not be able to launch the services until TSTT makes the underlying wholesale service available to Digicel. If Digicel's new service to its mobile customers is to compete with TSTT's new retail service, Digicel will be at a disadvantage because it will obtain access to the underlying wholesale product too late to commence the service at the same time as TSTT.

The panel agrees with NERA that innovation and investment can be limited by excessively burdensome access obligations. Obligations on TSTT's wholesale interconnection business ought to minimize the unnecessary creation of such disincentives. Section 42.1 already creates an obligation to provide the underlying wholesale service at the time of TSTT's retail market launch. The underlying question before the panel is whether this is sufficient or whether there remains some unfairness to new entrants in this arrangement that may impede the development of competition – and whether this can be remedied without unnecessarily creating disincentives for TSTT.

If Digicel wishes to launch a new retail service that requires an underlying wholesale service from TSTT, Digicel may face a disadvantage because it will have to request the service from TSTT, thereby giving TSTT notice of its intention to launch the retail service. TSTT would have immediate access to its own network services that would be required for it to launch the new retail service at the same time as or even before Digicel.

On the other hand, if TSTT wishes to launch a new retail service, the other operators will not know under clause 42.1 as drafted until the day TSTT launches it, and they will always be in a market follower position. The panel finds therefore that so long as TSTT is the only provider of wholesale services necessary to provide retail services, it will always enjoy a first-mover advantage. In effect, because TSTT has a fixed line network which it

developed under monopoly conditions, its service launch will always have the advantage over Digicel.

Section 5(1) of the Interconnection Regulations provides:

A concessionaire shall provide interconnection under the same terms and conditions and of the same quality as it provides for its own networks and services, the networks and services of its subsidiaries and partners, or the networks and services of any other concessionaire to which it provides interconnection.

The formulation above is similar to section 5(1) of the Concessions, except that they provide for “equivalent terms and conditions in equivalent circumstances to all other concessionaires”, and require interconnection under the same conditions and of the same quality “as it provides for its own retail services...” The Interconnection Regulations have been issued under the Act, and the Concession has been entered into pursuant to the Act and signed by TSTT.

The panel has considered both of these provisions, and concludes that it would reach the same conclusion under either with regard to the principle they embody for the purpose of this dispute. That principle is that operators requesting interconnection ought not to be disadvantaged when it comes to reliance upon the requested operator’s network and services. They are to be put in an equivalent position, treated the same as the concessionaire treats itself.

The panel finds that TSTT's first-mover advantage will be at odds with this principle until there are other fixed line operators which offer Digicel wholesale services that allow Digicel to initiate its own new retail services – with its own first-mover advantage.

Digicel's request appears at least in part to be geared towards equalising the situation. Just as TSTT would have effective notice from Digicel of its intention to launch a new retail service relying upon a TSTT wholesale service, Digicel would have advance notice of TSTT's intentions, and access to the underlying wholesale service required.

TSTT's argument outlined above appears intended to offer a different form of equalisation. Its Carrier Services Department would be required to keep Digicel's requests for new wholesale services confidential, and so Digicel would have no disadvantage compared to TSTT. Digicel could initiate its own retail services in reliance upon the discretion of TSTT's wholesale department and enjoy its own first-mover advantage. Whether this is realistic depends upon the framework in place for it.

Section 24(1)(j) provides that concessions must include obligations to "refrain from using, and maintain the confidentiality of any confidential ... and proprietary information of ... another operator...for any purpose" (other than operating, billing and certain protections). Regulation 10(7) in the Interconnection Regulations provides for a non-disclosure agreement for the benefit of the concessionaire disclosing the information. A form of non-disclosure agreement is set out in the First Schedule to the regulations, which provides for restrictive possession, knowledge and use of the information by the party receiving it, including on a "need to know" basis.

The draft Interconnection Agreement of the parties submitted with Digicel's Complaint included a confidentiality clause in section 18. Section 18 provides that a party receiving disclosure from the other must keep it confidential, and indeed restrict disclosure to those who have a reasonable need to know. In particular, section 18.4. provides, "...a Receiving Party shall not use the other Party's Confidential Information to provide commercial advantage to its Customer Facing Divisions."

The panel considers that effective and secure compliance with the confidentiality provisions of section 18 would likely require TSTT to implement some level of structural separation and confidentiality procedures, if it has not already done so. These would necessarily include policies to ensure that TSTT's wholesale service section provides the same notice to Digicel as to TSTT's mobile division of any new wholesale services that are to be made available.

In the panel's view, if TSTT does or has already done so in a manner that can be relied upon, this will go a considerable distance towards equalising the parties' positions. However, the panel has no evidence before it about whether TSTT has established and implemented such procedures. Until TSTT shows that it has, Digicel is in the panel's opinion entitled to measures that ensure that TSTT does not have an advantage due to its dominance in fixed network provision.

In order not to unnecessarily burden TSTT, however, the requirement to provide advance notice and the underlying fixed wholesale services should not apply in respect of every retail service. There may be fixed retail services with which Digicel is not reasonably likely to compete, for example because there will only be demand in the fixed sector. The requirement should only

apply where services provided to TSTT's fixed line retail customers are being launched for its mobile customers.

The panel finds that TSTT must provide three months' advance notice and access to the underlying wholesale services in respect of its fixed retail services which it is launching in the mobile sector. This requirement should apply, however, until TSTT shows (if it has not already done so) to the satisfaction of the Authority that it has implemented such structural separation and confidentiality procedures as may reasonably be necessary to comply fully with the confidentiality obligations in the Act, the Interconnection Regulations and the parties' Interconnection Agreement, and applies policies to ensure notice at the same time to Digicel as to TSTT's mobile division. In the panel's recommendations at the end of this decision, the panel recommends to the Authority that it be prepared to consider any submission of TSTT in respect of such matters in light of international best practice.

8. DIVERSITY OF FIBRE

The Parties' submissions on this issue have been less than models of clarity. At times, they appear to be sparring over one fibre route – that between their original interconnect switch locations – while at other times they are clearly arguing over rules of general applicability.

Digicel requested that the Interconnection Agreement include a requirement that TSTT provide diversity of fibre, where it would be subject to regulation and safeguards. Mr. Tott gave evidence that diversity of fibre is invariably included in interconnection agreements of incumbent operators. Mr. Tott again referred to British Telecom's RIO in this regard. According to Digicel, it is necessary to ensure that in the event of failure of primary fibre, traffic can still route between the customers of the operators.

TSTT did not dispute Mr. Tott's evidence. However, TSTT argued that it has already provided diverse fibre routing between the parties' interconnect switch locations on 10 March 2006. The panel understands TSTT's argument to be that it has provided what Digicel requests and therefore Digicel's request is redundant. This begs the question why Digicel continues to include this request in its pleadings, the answer to which requires some review of its origin.

The Interconnection Agreement submitted to the panel with Digicel's Complaint included a Joint Working Manual, which provided:

1.2.2.1 No physical route diversity is provided as Part of the Optical In-span Joining Service. However, an additional route can be added if technical issues or

traffic volumes warrant.

In Digicel's Complaint dated 27 January 2006, it requested that TSTT be directed to provide and test and make ready for use the first fibre connections between TSTT and Chaguanas by 3 February 2006, and the second fibre connection by 10 February 2006. If the second fibre was not completed within that time, Digicel requested physical route diversity to be provided as part of the optical in-span joining service – which was then explicitly excluded by section 1.2.2.1.

According to TSTT's Response on 10 February 2006, TSTT completed the first fibre connection ahead of schedule and was preparing the second fibre connection. Digicel's Reply on 20 February 2006 stated that it was not satisfied and requested that TSTT be mandated to provide diversity of fibre to encourage earlier provision in the future.

TSTT's argument is that it has provided diversity of fibre. According to the parties' submissions, then, TSTT has provided diversity of fibre despite the draft agreement explicitly saying that none is to be provided. Consequently, diversity of fibre is in place without a contractual framework. The panel understands Digicel's request now not so much to focus on that particular fibre route, but to be that the relevant provision of the Joint Manual pertaining to the Optical In-Span Joining Service be revised to mandate diversity of fibre when either party so requests. Thus, the fibre route already provided by TSTT (and any diverse fibres that may be requested by either party in the future) would be subject to the Interconnection Agreement.

In light of the evidence and the importance of route diversity in network design and provisioning, the panel concludes that there is a need for a suitable contractual framework with procedural and other safeguards. The panel

finds it unsatisfactory that route diversity not be governed by the Interconnection Agreement. It should be governed by the Interconnection Agreement, and Digicel's request to include references to route diversity in the Joint Manual or elsewhere in the Interconnection Agreement is granted.

9. RECOMMENDATIONS TO THE AUTHORITY

The Authority's Dispute Procedures provide in section 2.10.12 that the panel may recommend to the Authority any action within the provisions of the Act. Over the five month course of this proceeding since it was appointed, the panel has reviewed in detail 1,000 – 2,000 pages of submissions and reports, and heard extensive arguments covering a range of matters. On the basis of these and the panel's own reflections on the substantive issues and the process of this dispute, the panel has identified various considerations which may assist the Authority in advancing the goals and objects of the Telecommunications Act.

Accordingly, with all due deference to the Authority's proper powers and authority to make its own determinations in its wisdom, the panel offers the following recommendations:

The panel recommends that the Authority consider developing a sector specific cost model for the purposes of considering whether proposed charges comply with the regulatory framework, or for setting charges if so required.

To the extent that the Authority conducts a review of an operator's cost model with a view to its potential use in providing a representative cost for other operators, the panel recommends that the Authority determine principles regarding the use and disclosure of operators' commercial information to affected operators.

The panel also recommends that in considering the manner the Authority may prescribe for the establishment of costs of unbundled elements of the network, the Authority take into account the risks of and incentives for cross-

subsidisation by an integrated fixed and mobile operator. In this light, the panel recommends that the Authority consider requiring effective accounting separation for integrated fixed and mobile operators and such other areas as the Authority may consider appropriate. The panel also expects that this would be likely to strengthen assurance that lower mobile termination costs of an integrated mobile and fixed operator are “passed through” to the retail prices of fixed origination.

The panel believes there may be advantages if consumers have greater transparency about the interconnection charges indirectly included in the prices they pay. The panel recommends that the Authority consider whether the explicit identification in customers’ bills of the interconnection charges relating to their calls might reduce consumer ignorance regarding the level and recipients of termination charges. This, in the larger scheme of competition amongst operators, may create some competitive effects. In the longer term, the panel recommends that the Authority consider whether an originating operator may become a collector of termination charges on behalf of the terminating operator and alternatives to the calling-party-pays regime.

The panel notes that the Authority’s Procedures for the Resolution of Disputes, dated 18 January 2006, apply when disputes have been formally referred to the Authority. The panel recommends that the Authority consider establishing a well-resourced process designed to build consensus on differences between parties before they mature into disputes. Such a process may reduce the contentiousness of the environment and reduce the resources required to deal with disputes in the long term. It may also help identify issues on an ongoing basis which might appropriately be treated by regulation.

The panel recommends that the Authority review TSTT's cost model and other submissions with a view to determining whether TSTT has an access deficit, and if it does, its magnitude. The panel also recommends that the Authority consider how, when and whether it should use its powers under the Telecommunications Act taking into account its findings regarding the existence and magnitude of any such access deficit, and the Authority's assessment of the effect that the introduction of competition is expected to have.

The panel recommends that the Authority consider what in light of international best practice would be appropriate evidence of sufficient structural separation and confidentiality and notice procedures for TSTT's Carrier Services Division. The panel recommends also that the Authority prepare to receive a submission from TSTT in that connection.

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This decision is made under the Authority's Dispute Procedures in accordance with the Terms of Reference of the panel on 16 August 2006.



Rory Macmillan, Chairman



Dr. Ronald Ramkissoon



Dr. Shahid Hussain

Information about the panel

Mr. Rory Macmillan is a member of the New York Bar and a graduate of the University of Edinburgh and Yale Law School. He practiced law in New York and London with the international law firm Debevoise & Plimpton, before establishing his own practice. He now specializes in telecommunications law and dispute resolution, advising governments, regulatory authorities, incumbent operators, new entrants and investors. He is a member of the Chartered Institute of Arbitrators in London and a mediator accredited by the Centre for Effective Dispute Resolution.

Dr. Shahid Hussain is Professor of the Centre for Information and Communications Technology program studies at The University of Trinidad and Tobago. He has 30 years of telecom industry experience as a senior executive in Canada, where he had extensive interactions with the Canadian regulator CRTC during Dr. Hussain's involvement with Telus Corporation and Bell Canada. He has been involved in the liberalisation process of the Canadian telecom sector, and led many task forces, committees and panels involved in high-tech economic development and technology development in telecom industry. Dr. Hussain has a PhD in Electrical Engineering with major in Communications from University of British Columbia, Canada.

Dr. Ronald Ramkissoon graduated from the University of the West Indies with a BSc, MSc and Phd in Economics. He worked as an economist at the Central Bank of Trinidad and Tobago for 12 years. He is now Senior Economist and Manager, Economics Intelligence Unit, at Republic Bank, one of the Eastern Caribbean's largest commercial banks. He is also a Vice President of the Caribbean Association of Industry and Commerce.