Public Inquiry into the Service-Specific Pricing Principles for Domestic Mobile and Fixed Terminating Access Services – Methodology and Principles

PUBLIC INQUIRY REPORT – PART I (METHODOLOGY)

RESPONSE TO COMMENTS AND DRAFT PARTIAL DETERMINATION (METHODOLOGY) ON SERVICE-SPECIFIC PRICING PRINCIPLES FOR MOBILE AND FIXED TERMINATING ACCESS SERVICES

In Reference to

Discussion Paper: Domestic Mobile Terminating Access Services and Domestic Fixed Terminating Access Services. Public Inquiry into the Service-Specific Pricing Principles for Domestic Mobile and Fixed Terminating Access Services – Methodology and Principles

Issued on 5 June 2024

18 July 2025

Table of Contents

1. Introduction

1. On 1 December 2023, following a recommendation by the National Information and Communications Technology Authority ("NICTA"), the Minister declared the domestic Mobile Terminating Access Service (MTAS) and the domestic Fixed Terminating Access Service (FTAS).[1] The Wholesale Service Declaration No.1 of 2023 was published in the National Gazette on 7 December 2023.
2. Section 135 of the National Information and Communications Technology Act 2009 (the "Act") gives power to NICTA to make a determination on the service-specific pricing principles applicable to the supply of the MTAS and FTAS declared services. In particular, Section 135(2) empowers NICTA to make service-specific pricing principles that:

   "may contain price related terms and conditions (whether relating to a price or the method of ascertaining a price) and non-price terms and conditions relating to access to the declared service."

3. On 5 June 2024 pursuant to Section 230 of the Act, NICTA initiated a public inquiry into the service- specific pricing principles for the MTAS and FTAS declared services and issued a Discussion Paper entitled "Domestic Mobile Terminating Access Services and Domestic Fixed Terminating Access Services. Public Inquiry into the Service-Specific Pricing Principles for Domestic Mobile and Fixed Terminating Access Services – Methodology and Principles" (the "Discussion Paper").
4. In the initial phase, NICTA invited interested parties to provide comments and answers to 28 questions posed in the Discussion Paper about the proposed methodology and principles to be used for setting price related terms and conditions for the supply of the MTAS and FTAS (the "Declared Services"), in accordance with Section 135 of the Act.
5. Following the publication of the Discussion Paper, NICTA received comments from the following interested parties:

   Vodafone PNG ("Vodafone"), dated 5 July 2024;[2]

   Digicel (PNG) Limited ("Digicel"), dated 5 July 2024;[3] and

   Telikom Limited ("Telikom"), dated 19 July 2024.[4]

6. The comments received were very thoughtful and we thank the interested parties for their input in the initial phase of the inquiry. Some of their comments made

[1] Wholesale Service Declaration No. 1 of 2023.
[2] Vodafone PNG response to NICTAs 5th June 2024 Discussion Paper entitled "Domestic Terminating Access Service and Domestic Fixed Terminating Access Service" as part of the Public Inquiry into Service-Specific Pricing Principles for Domestic Mobile and Fixed Terminating Access Service- Methodology and Principles. 5th July 2024, Final Version.
[3] Digicel (PNG) Limited. Submission to NICTA. Public Inquiry into the Service-Specific Pricing Principles for Domestic Mobile and Fixed Terminating Access Service – Methodology and Principles. 5 July 2024.
[4] Telikom Limited. Response to NICTA's Public Inquiry into the "SERVICE-SPECIFIC PRICING PRINCIPLES FOR DOMESTIC MOBILE TERMINATION ACCESS SERVICE AND DOMESTIC FIXED TERMINATION ACCESS SERVICE – METHODOLOGY AND PRINCIPLES". Friday 19 July 202[4].

NICTA revise some of its preliminary views on the methodology and principles presented in the Discussion Paper. This has allowed NICTA to make a better decision on the methodology and principles, to be used for setting price-related terms and conditions for the supply of the Declared Services in the second phase of this public inquiry.

7. With the publication of this Public Inquiry Report and the accompanying draft partial determination in Annex A (Draft Partial Service-Specific Pricing Principles for Mobile and Fixed Terminating Access Services), the initial phase of this public inquiry has concluded. We are including this partial determination to inform interested parties about the methodology NICTA will use to calculate cost-based prices for the Declared Services following the completion of the first phase of this public inquiry. In consequence, NICTA is starting the second and final phase of this inquiry which will involve consultation on the application of the methodology and principles described in Annex A to calculate the costs and determine the prices of the Declared Services.
8. For the avoidance of doubt, this second phase will only be concerned with the cost calculations and the determination of prices resulting from the application of the methodology and principles described in Annex A, and not with the methodology and principles themselves, which were consulted with interested parties in the initial phase.
9. In what follows, this Public Inquiry Report presents the questions and comments received from interested parties to the 28 questions posed in the Discussion Paper. For each question or group of questions, we address the comments received and then state NICTA's final determination on the questions posed to interested parties. In the final section, we present, and address comments provided by Digicel that are not specific to the set of questions posed in the Discussion Paper.

2. Comments and Responses to Comments - Questions 1 and 2

Question 1: Do you think an international benchmark approach to determine the price of the declared services would be consistent with the general pricing principles in Section 134 of the Act? If you do, please explain your rationale.

Question 2: In case you think that both approaches (the cost modelling and an international benchmark) are consistent with Section 134 of the Act, which approach do you think would be preferable for NICTA to implement and why?

2.1 Comments received from interested parties

10. Question 1: Telikom expressed approval for the view that international benchmarking may be appropriate for determining termination rates for PNG. In particular if the data is from countries that had developed cost models following principles consistent with the general pricing principles under Section 134 of the Act.
11. Question 2: Telikom seems to agree that both, a cost-modelling, and international benchmarking approaches could be used by NICTA to determine termination rates, as long as both are consistent with the general pricing principles. However, Telikom

expressed doubts of the appropriateness of using international benchmarks when there are cost differences between those countries and PNG.

12. Question 1: Vodafone pointed out the benefits of international benchmarks: lower data requirements and less burden on operators, and faster to implement. On the other hand, Vodafone pointed out that benchmarking only offers an indirect route to estimate costs and that it may be difficult to find a comparable country to PNG. Nevertheless, Vodafone appears to favour the use of benchmarking as an interim solution to identify whether existing termination charges are too far from what could be regarded as reasonable and use it to adjust termination charges to be more aligned with costs.

13. Question 2: Vodafone agrees with NICTA's preliminary view that cost modelling could be preferable than benchmarking since a cost model can be developed to reflect efficient costs of an operator in the specific context of PNG. However, Vodafone made a distinction between cost modelling for mobile termination and for fixed termination. Vodafone's view is that for practical reasons and given the much larger mobile traffic compared to the fixed line traffic, Vodafone would favour a cost modelling approach for mobile termination access (MTAS) only, and for expediency, to use a benchmarking approach for fixed termination access (FTAS).

14. Questions 1 and 2: Digicel provided answers and comments to Questions 1 and 2 together. Digicel's comments for these two questions appear in paragraphs 24 through 39 of Digicel's submission. Digicel's view is that there is no one right answer to the question of what the cost-based price for the MTAS (or FTAS) is. Digicel pointed out that regardless of the approach used, cost modelling or international benchmarking, the cost analysis will rely on a range of assumptions, estimates, and judgments, to produce cost estimates that may then be used to make a determination on access pricing.

15. Digicel also views international benchmarking that combines the results of a variety of cost models, as arguably, a more accurate approach than one single PNG-specific cost model. Digicel adds, that the international benchmarking approach is a relatively straightforward and pragmatic approach and that any benefit of greater accuracy in estimating termination costs via a local cost model would likely be more than offset by the cost and duration of that approach relative to benchmarking. It also views benchmarking of costs as a useful tool to be used to inform modelling assumptions and decisions even when a cost modelling approach is used.

16. Digicel disagrees with NICTA's view that there should be a preference for cost modelling over international benchmarking. Digicel also pointed out that depending on how cost modelling is undertaken it may not be consistent with the general pricing principles (GPPs) which they say, require that each service provider's cost be considered, and therefore, may require multiple models, further increasing the complexity of the cost modelling process.

17. In addition, Digicel proposed a two-step approach for access disputes: in which in the first step a benchmarking approach shall be implemented, and then if a dispute is not resolved, a cost modelling should be undertaken as last resort.

2.2 NICTA's responses to comments received on questions 1 and 2

18. NICTA thanks the interested parties for their thoughtful comments. Overall, we felt that they reflect the complex nature of the task at hand. We are sympathetic to the views expressed in the comments that both approaches could be consistent with the general pricing principles (GPPs), when implemented appropriately.

19. We are also inclined to agree with the views about the benefits of a benchmarking approach to calculate the costs of the MTAS and FTAS, namely, expediency, less data burden on licensed operators, and less burden on NICTA also.

20. However, NICTA's view is that these benefits could come with a downside, namely that it would be quite difficult to find benchmarks that closely resemble the cost structure and market conditions of providing the wholesale services in PNG, which could lead to cost estimates far removed from those of an efficient operator in PNG. This in turn, may lead to those estimates not being in accordance with the GPPs.

21. Even with well-designed selection criteria to rule out jurisdictions where the cost structure and demand conditions may be too different from PNG, the remaining benchmark jurisdictions could have significant cost differences with the efficient costs of providing the wholesale services in PNG. To compensate for this, the benchmarks are typically adjusted to consider cost differences between these jurisdictions and PNG. However, these adjustments are typically performed by national regulatory authorities with a great deal of discretion. This results in the final data on termination prices being different from the original data, which raises the question as to whether the final adjusted data can be regarded as cost based. As a reference it is instructive to cite an ITU publication on this matter:

> *"It is worth bearing in mind that each adjustment that is made to the benchmark data in an effort to improve comparability or relevance shifts the benchmark data further away from their actual values and ultimately towards a point where the benchmark data no longer reflects any actual prices."*[5]

22. For these reasons, NICTA is not convinced that international benchmarking would constitute a better approach to estimate the efficient costs of providing the wholesale services in PNG.

23. While we appreciate the benefits of expediency and low burden of benchmarking, this comes with considerable downside of arbitrary adjustments to the benchmark data as cited above. NICTA considers that a cost modelling approach, where network topology, network costs, traffic, and many other variables are actually modelled, would more accurately reflect the true efficient cost of providing the Declared Services in PNG.

24. Another argument which Digicel appears to put forth in support of its view in favour of using international benchmarking (instead of cost modelling) is that cost modelling "may require multiple models to be prepared, further increasing the

[5] ITU, "A Practical Guide on Benchmarking Telecommunication Prices." ITU, August 2014. pp. 1.

complexity (and costs) of the modelling process".[6] This seems to suggest that NICTA could use asymmetric termination rates; that is a different termination rates for each access provider (for the MTAS). Although this issue is more relevant to questions 9 through 11, and paragraphs 96-98, and 112-122 in the Discussion Paper, it is worth addressing this matter up front.

25. NICTA rejects Digicel's suggestion that it may require the development of cost models for each MTAS provider for various reasons. First, if we are to base the pricing of the Declared Services on the efficient costs of producing those services as required by the GPPs and the efficiency objective in Section 124(1) of the Act, it is necessary to model the costs of a reference or notional efficient operator. This implies that only one cost model is to be developed for the MTAS, which in turn leads to the use of symmetric termination rates and not asymmetric termination rates as Digicel seems to suggest. For the avoidance of doubt, when developing the cost model for the MTAS, NICTA will consider the data and information provided by each licensed operator.

26. Second, over the past 25 years, national regulatory authorities had moved away from using asymmetric termination rates towards symmetric rates as it became increasingly evident that it was not conducive toward efficiency. Asymmetric rates that allowed each operator to recover its actual costs provided no incentive to inefficient operators to improve efficiency. The more efficient operators would end up subsidizing the inefficient ones. Such a situation would be inconsistent with the efficiency objective in Section 124 of the Act, and with the GPPs' requirement in Section 134 (1) (a) (i) to set the price of the Declared Service to cover the efficient costs of providing such service.

27. Third, it is a well-established international best practice to model a notional or reference efficient access provider using one single cost model to set symmetric termination rates between access providers. It is worth citing what the European Commission says about this matter on its recommendation on the regulatory treatment of fixed and mobile termination rates in the EU:

> *"the Commission has for a long time recognised that setting a common approach based on an efficient cost standard and the application of symmetrical termination rates would promote efficiency…(…)…the regulated termination rates should be brought down to the cost of an efficient operator as soon as possible."*[7]

28. Finally, there seems to be an inconsistency in Digicel's argument, which on the one hand seems to argue against the use of a single (symmetric) termination rate if a cost modelling approach is used, while arguing in favour of the use of a single (symmetric) termination rate if an international benchmarking approach is used. Here we must point out that an international benchmark approach is typically based

[6] Digicel (PNG) Limited. Submission to NICTA. Public Inquiry into the Service-Specific Pricing Principles for Domestic Mobile and Fixed Terminating Access Service – Methodology and Principles. 5 July 2024, para. 37.
[7] The Commission of the European Communities. RECOMMENDATIONS. COMMISSION. "Commission Recommendation of 7 May 2009 on the Regulatory Treatment of Fixed and Mobile Termination Rates in the EU." 2009|396|EC. Para. 7-8. Official Journal of the European Union L124

on a single termination rate per country in a sample of countries, which then results in a single symmetric termination rate.

29. In paragraph 39 Digicel proposes a two-step approach to resolve access disputes where they propose to use international benchmarking as a first step to inform an arbitration in any dispute. Then, if the access dispute is unable to be resolved through the use of international benchmarking, NICTA would develop a cost model to resolve the dispute, as last resort. NICTA wishes to point out that this public inquiry was initiated on NICTA's own accord pursuant to Section 230(1) of the Act, and not in the context of a resolution of a dispute about access as Digicel seems to imply. Being this public inquiry unrelated to any dispute about access, and the fact that no reference to a dispute was made in the Discussion Paper, NICTA fails to see the relevance of Digicel's comment to this public inquiry.

30. In paragraph 31 Digicel refers to "existing" service-specific pricing principles (SSPPs) to support its view that international benchmarking is "*still widely used to inform modelling assumptions and decisions.*" While we agree with Digicel that international benchmarking can be a useful tool to inform modelling assumptions, we reject Digicel's reference to "existing SSPPs" (see Digicel's submission paragraphs 9 and 10). The "existing SSPPs" that Digicel refers to, are related to wholesale services that were declared (deemed declarations) pursuant to Section 131 and Schedule 1 of the Act. The so-called "existing SSPPs" expired on 31 December 2014, more than 10 years ago. In consequence, these have not been in force for approximately 10 years. NICTA fails to understand why Digicel refers them as "existing SSPPs" when the Act clearly states that SSPPs expire when the associated declaration expires.[8]

2.3 NICTA's conclusion – Questions 1 and 2

31. In principle NICTA accepts that both approaches: cost modelling and benchmarking, could be regarded as being in accordance with the GPPs, and therefore, could be used to calculate the costs of supplying the MTAS and FTAS.

32. NICTA also views the cost modelling approach as providing greater accuracy for calculating PNG-specific efficient costs of supplying the Declared Services. Despite its greater data requirements and modelling time, NICTA will use a cost modelling approach to calculate PNG-specific efficient costs of providing the Declared Services. For the avoidance of doubt, NICTA intends to model the costs of an efficient notional or reference access provider to come up with symmetrical MTAS.

33. NICTA does not discard the option of using an international benchmark approach if it determines that the data received from the access providers is inadequate for developing a cost model to calculate the cost of supplying the MTAS or FTAS. In addition, NICTA will use benchmarking to justify some of the cost assumptions that go as input in the cost models.

[8] See Section 135 (5) of the Act: "*Unless sooner revoked, any service-specific pricing principles ceased to be in force on the date of expiry of the declared service to which they relate*."

3. Comments and Responses to Comments - Questions 3 and 4

Question 3: Do you agree that NICTA should use a top down (if data is available) or a bottom-up approach to cost modelling to calculate cost-based prices for the Declared Services in accordance with Section 134 of the Act? Please explain your reasons for why one approach would be preferable over the other.

Question 4: Do you agree that NICTA could also use a hybrid approach should enough data become available from the operators? Explain your reasons for agreeing or disagreeing.

3.1 Comments received from interested parties

34. Questions 3 and 4: Telikom's view is that in principle both, bottom-up and top-down approaches could be consistent with the GPPs in Section 134 of the Act. Ultimately it would depend on how the cost model is implemented. It also acknowledges that one approach (bottom-up or top-down) may not be enough due to information gaps and that, in consequence, a hybrid model would be preferable and more in line with international best practice.

35. Question 3: Vodafone's view is that a bottom-up approach with suitable cross-checking of assumptions against operator's accounting data would be more likely to yield results that are consistent with the GPPs, in particular, to ensure that only efficient costs are recovered.

36. Question 4: Vodafone states that a hybrid approach to cross-check assumptions in the bottom-up model could provide additional reassurance to licensed operators that the assumptions used in the model are reasonable, and in consequence that the cost estimates would be reasonable.

37. Question 3 and 4: Digicel maintains its position that cost modelling should not be preferred over international benchmarking. However, in paragraph 41 Digicel states that in the event that cost modelling is used in the context of a determination of an access dispute the only approach that would be consistent with the GPPs would be the "hybrid approach" discussed in the Discussion Paper.

38. In support of this view, Digicel cites Section 124 (2) of the Act which relates to matters NICTA would need to consider in determining the extent by which something would further the efficiency objective in the Act. Digicel, then cites Section 134(2) of the Act which defines "cost-based pricing", and the factors NICTA would need to consider when using the cost recovery principle to determine cost-based prices. In addition, Digicel cites the definition of "efficient costs" under Section 134(2) of the Act.

39. In paragraph 47 Digicel expressed its views that a sole reliance on a bottom-up cost model would not be consistent with the GPPs because in determining whether the efficiency objective is met, the Act requires the analysis of "cost-based pricing and efficient cost to be undertaken with reference to an actual service provider and that service provider's actual costs.;" which in their view, the sole reliance on a bottom-up model would not be consistent with the GPPs.

40. In paragraphs 48-49 Digicel states that it may not be possible for NICTA to assess whether or not an access provider reported costs are inefficient by relying solely on the access provider's top-down cost model. NICTA may need to perform an assessment of these costs either by benchmarking against other networks or through a bottom-up analysis of a hypothetical efficient network. Digicel maintains that either an "optimized top-down approach" or a "hybrid approach" towards cost modelling is more likely to be consistent with the GPPs than relying solely on a bottom-up approach.

3.2 NICTA's responses to comments received on questions 3 and 4

41. NICTA agrees with both Telikom and Vodafone views; in particular with a hybrid approach where operator's accounting data and costs are used in conjunction with appropriate benchmarks to inform or cross-check the assumptions of a bottom-up cost model.

42. Digicel's comments again make reference to cost modelling in a context of an access dispute.[9] NICTA again wants to reiterate that this public inquiry is not in response to an access dispute. In NICTA's Discussion Paper, there is no mention of any access dispute in connection with this public inquiry. NICTA initiated this public inquiry on its own accord.

43. Nevertheless, we are sympathetic to the views expressed in Digicel's submission, in particular, with respect to paragraphs 47-49, which seems to be also consistent with Vodafone's views in the sense that the cost estimates of a Declared Service would come from a bottom up cost model, but the assumptions used as inputs for the cost model, must consider not only the accounting data from access providers in PNG, but also from benchmarks of other operator's costs, to ensure that the assumptions used in the bottom up model are reasonable and in accordance with the GPPs.

3.3 NICTA's conclusion – Questions 3 and 4

44. NICTA is of the view that either a bottom-up, a top-down, or a hybrid approach, could produce cost estimates that are in accordance with the GPPs.

45. The cost estimates of the Declared Services would come from NICTA's bottom-up cost model. However, NICTA will use parts of a top-down model to inform the various assumptions required for the bottom-up cost model. NICTA will consider not only cost data from the access providers but also benchmark those costs against international operators to come up with reasonable assumptions to be used in the bottom-up cost model. This is what NICTA refers as a hybrid approach.

4. Comments and Responses to Comments - Questions 5 and 6

Question 5: With respect to the inclusion or exclusion of common costs; do you agree that

[9] See Digicel's submission, para. 41.

Section 134 (2) of the Act rules out the use of a pure LRIC cost allocation approach because the Act requires the inclusion of "fair and reasonable common costs" in the calculation of the costs of the Declared Services? If you disagree, please explain why.

Question 6: Do you agree that NICTA should use a LRIC+ approach for allocating cost in the cost model? Please explain why you agree or disagree.

4.1 Comments received from interested parties

46. Questions 5 and 6: Telikom agrees with NICTA that Section 134 (2) of the Act effectively rules out the use of a Pure LRIC cost allocation approach. Telikom also agrees with NICTA that a LRIC+ approach should be used.

47. Question 5: Vodafone disagrees with NICTA, indicating that a pure LRIC approach would be appropriate and consistent with the Act. In support of their view, Vodafone provides the EU as an example where none of the fixed and common costs are recoverable from call termination services.

48. Question 6: Vodafone reiterated its view that a pure LRIC approach should not be discounted, however, should pure LRIC be discarded, then a LRIC+ approach would also be appropriate in their opinion.

49. Questions 5 and 6: Digicel agrees with NICTA that a pure LRIC approach would be inconsistent with the requirements in the GPPs. On the other hand, Digicel is of the view that either a FAC or LRIC+ approach might be consistent with the GPPs. However, Digicel seems to favour a FAC approach with appropriate adjustments for efficiency, over a LRIC+ approach because in their view, the FAC would better reflect the actual costs to the access provider. Nevertheless, Digicel favours delaying any final decision on whether NICTA should us a FAC or LRIC+ approach.

4.2 NICTA's responses to comments received on questions 5 and 6

50. NICTA agrees with Telikom and Digicel in that Section 134 (2) of the Act rules out the use of a pure LRIC cost allocation approach.

51. NICTA disagrees with Vodafone's view that a pure LRIC approach should not be ruled out. Although Vodafone's example about the use of a pure LRIC approach in the EU is accurate, NICTA cannot apply those same standards to PNG because we are constrained by Section 134 (2) of the Act.

52. NICTA agrees with Telikom's view that an LRIC+ approach to cost allocation would be appropriate.

53. NICTA acknowledges Digicel's view that in addition to an LRIC+ approach a FAC approach with appropriate adjustments for efficiency may also be appropriate. However, NICTA's view is that a FAC approach which is often implemented based on a top-down model, could be prone to arbitrary rules for allocating common and joint costs. This is because it lacks the cost-volume relationships between network components associated with inputs needed for the supply of certain services which are explicitly modelled in an LRIC+ approach. These cost-volume relationships make the allocation of costs more transparent in a LRIC+ approach.

54. Digicel's comment is perhaps a reflection that it is concerned that not all the services (forward-looking) costs would be included in the cost model. NICTA wishes to clarify that it intends to include all the services supplied by the access provider in the cost models. In that respect, NICTA's intended approach is what is often called in some jurisdictions a TSLRIC+ approach.

55. NICTA disagree with Digicel's view of not deciding on this matter at this time because we do not see the benefit of it.

4.3 NICTA's conclusion – Questions 5 and 6

56. NICTA rules out the application of a pure LRIC cost allocation approach and instead will use a LRIC+ (also known as a TSLRIC+) cost allocation approach that includes fair and reasonable common and joint costs.

5 Comments and Responses to Comments - Questions 7 and 8

Question 7: Are you in agreement with NICTA's view that the use of current cost accounting (CCA) to value the capital assets used for the supply of the Declared Services would reflect the efficient costs of those assets, and that historical accounting costs wouldn't?

Question 8: Do you agree with the approach of valuing assets using the cost of a modern equivalent asset (MEA)?

5.1 Comments received from interested parties

57. Questions 7 and 8: Telikom agrees in principle with the use of CCA to value capital costs but pointed out that accurate assessment would be important for valuing such assets as some are unique and have specialized applications.

58. Questions 7 and 8: Vodafone is in agreement with NICTA's proposed use of CCA, but it adds that what is required is to value those assess using forward-looking costs to take into account the latest most-efficient technology. In addition, Vodafone agrees with NICTA that using a MEA approach to value capital assets is the appropriate approach.

59. Questions 7 and 8: Digicel's view is that the approach to value capital related costs is to start with the value of the depreciated current assets; then for future years add the expected capital expenses reflecting the replacement of assets used to provide the wholesale services. The aggregate amount should be depreciated each year in line with the expected life of the assets. Digicel, also adds that the GPPs are clear in that capital related costs should be values based on actual cost to the access provider.

5.2 NICTA's responses to comments received on questions 7 and 8

60. NICTA views Telikom and Vodafone's comments as agreeing with our proposal to use forward-looking CCA and MEA to value capital related costs.

61. On the other hand, Digicel proposes an approach based on the actual depreciated asset values and on the replacement values of those assets for future years. Digicel states in support of its view that the GPPs "make repeated and express references to the requirement to consider a service provider's actual costs". This makes it seem that Digicel is advocating for the use of historical cost accounting with no reference to the economic value of those assets. As indicated in the Discussion Paper, paragraphs 78-84, it is clear that the term "costs actually incurred" in Section 134 (2) of the Act, refers to economic costs, and not historical accounting costs. Therefore, Digicel's proposal could be acceptable to NICTA only if the depreciated costs of the capital related assets refer to the economic cost of the depreciated assets in use.

5.3 NICTA's conclusion – Questions 7 and 8

62. NICTA will not use historical accounting costs to value the capital assets used for the supply of the Declared Services as that will likely not reflect efficient economic costs and in consequence, would be inconsistent with the GPPs and the efficiency objective in the Act. Instead, NICTA will use either (i) CCA and specifically a modern equivalent asset approach to value the capital assets used to supply the Declared Services, or (ii) calculate the replacement cost of the capital assets based on the economic costs of those depreciated assets, or (iii) a combination of both.

6 Comments and Responses to Comments - Question 9

Question 9: Do you agree that NICTA should implement a modified scorched node approach, but if not enough information is available from the reference operators, NICTA may use a scorched earth approach? Please explain why or why not.

6.1 Comments received from interested parties

63. Telikom agrees with the use of a modified scorched node approach, but if not enough data is available, it would be in agreement with the use of a scorched earth approach.

64. Vodafone thinks it unlikely for NICTA to not have the required information to develop a scorched node cost model because in their view, NICTA collects this information from operators on a regular basis. Vodafone strongly favours the use of a scorched node approach as they view that approach the most commonly used by regulatory authorities.

65. Digicel considers the approach of using a hypothetical efficient operator inconsistent with the GPPs. Digicel considers that the use of a hypothetical efficient operator approach and the scorched node approach would be unlawful because the GPPs requires NICTA to use the costs actually incurred by the access provider to supply the

Declared Service, unless NICTA determines that such costs are inefficient, having regard to the efficiency objective in the Act.

6.2 NICTA's responses to comments received on question 9

66. NICTA acknowledges Vodafone's view in favour of a scorched node approach, provided that the required information has been received from the operators. NICTA, however, cannot guarantee that it would be the case. NICTA wants to reiterate that national regulatory authorities around the world, implement both scorched node and scorched earth approaches, or some version of a modified scorched node approach. However, we are sympathetic with Vodafone's view that a scorched node approach (provided the data is available), would be a reasonable approach to implement.

67. Digicel insists that any approach, scorched node, scorched earth, or a modified scored node approach to model a notional (hypothetical) efficient operator would be inconsistent with the GPPs. Digicel reiterates that in their view NICTA shall use the costs actually incurred by the access provider to supply the Declared Services unless NICTA determines that such costs are inefficient.

68. NICTA wishes to clarify that what we are discussing here is the network topology to be used in the cost model. That is, whether the model would use the actual location of the nodes of a reference operator or the optimized locations. The issue in discussion is not the cost standard, but whether the model would use actual node locations or optimized ones. As such, Digicel's objection to a scorched node approach which would use the actual location of a reference operator's nodes (assuming the information is available) seems a bit puzzling since that approach would more closely model the network topology of a reference operator relative to the alternatives.

6.3 NICTA's conclusion – Question 9

69. To the extent permitted by the information provided by the access providers, NICTA will preferably model the reference or notional efficient operator using a scorched node approach. However, if the information provided to NICTA is incomplete but adequate, NICTA will use a modified scorched node approach. If no or minimal information is provided to NICTA, then NICTA may use a scorched earth approach, or may discard the use of a cost model in favour of an international benchmarking approach.

7 Comments and Responses to Comments - Questions 10, 11, and 12

Question 10: Do you agree that NICTA should use one single model for the determination of the price of MTAS and a separate model for the FTAS? Please explain your reasons for why or why not.

Question 11: For the MTAS model; do you agree that the reference operator should be

modelled based on a market share and network coverage equivalent to that of Digicel's mobile network, or should NICTA use a market share of 1/N and the average network coverage of the operators? Please explain your reasons for preferring one over the other.

Question 12: For the FTAS model; do you agree that the reference operator should be modelled based on a market share and network coverage equivalent to that of Telikom's fixed network? Please explain your reasons for why or why not.

7.1 Comments received from interested parties

70. Question 10: Telikom agrees that separate models for the MTAS and the FTAS are warranted due to important differences in the cost structure to supply those Declared Services. Telikom also noted that vandalism costs in PNG imposes additional costs that must be reflected in the cost model.

71. Question 11: For the MTAS model, Telikom would not support using the reference operator's market share but did not elaborate further about the reasons for their view.

72. Question 12: For the FTAS model, Telikom supports the use of its own market share and network coverage since it is the only operator that runs a copper network.

73. Question 10: For determining the cost of the MTAS, Vodafone supports modelling a single notional operator. While in principle the same would apply to the FTAS, Vodafone's view is that given the relatively small number of fixed line subscribers, the development of a separate cost model for the FTAS, with the associated time-consuming process may not be warranted.

74. Regarding the MTAS, Vodafone also points out that despite its view that a single cost model should be developed, they say that it does not mean that NICTA should use symmetric rates. Instead, Vodafone would favour asymmetrical MTAS rates with a higher rate for new entrants and a lower rate for larger operators. In Vodafone's view, this would compensate for the imbalance of traffic between incoming and outgoing traffic experienced by new entrants.

75. Question 11: Vodafone view is that modelling a notional operator with a 1/N market share would lead to the dominant operator being overcompensated for the MTAS.

76. Question 12: Vodafone reiterates its doubts about the value of developing a FTAS cost model due to the small number of fixed line subscribers. However, should NICTA decide to develop such cost model, the fact that Telikom is a monopoly provider of fixed line services makes them indifferent because it would be the same.

77. Questions 10 and 11: Digicel considers that due to its considerable network coverage, much extensive than any other operator, the reference network for modelling purposes should be its own network. Digicel considers this important as they say, Digicel is likely to face much greater unit costs than other operators which have concentrated in more densely populated areas. However, in terms of demand, Digicel considers that the market is rapidly changing, and its market share is rapidly eroding. Therefore, they consider appropriate for a forward-looking cost model to model a reference operator with a market share of 1/N, or 33.33%.

7.2 NICTA's responses to comments received on questions 10, 11, and 12

78. Question 10: NICTA is in agreement with Telikom's view on the need to have a separate cost model for the FTAS due to significant differences in the cost structure of the mobile and fixed networks. NICTA also agrees with Vodafone's view that for the MTAS, a single cost model of a notional efficient operator would be most appropriate. However, NICTA disagrees with Vodafone's argument to have asymmetrical termination rates with higher rates for the new entrant and lower rates for the incumbent. Our disagreement stems from the fact that asymmetric rates would not be supported by the results of a cost model of a notional efficient operator. To justify asymmetric rates in the fashion described by Vodafone, NICTA would need to appeal to some policy goal that may be inconsistent with the GPPs. In addition, NICTA would need to use a considerable amount of discretion to set those asymmetric rates; discretion that may not meet the requirements under the GPPs or may be inconsistent with the efficiency objective in the Act.

79. Question 11: Telikom and Vodafone did not offer a clear answer to this question and only stated what they opposed. Digicel on the other hand, provided a clear position in favour of modelling the reference operator's coverage based on Digicel's network because it is the most extensive network in PNG, reaching many areas not reached by other operators. NICTA finds this argument reasonable and support using Digicel's network coverage for modelling purposes of the reference or notional operator.

80. On the other hand, NICTA disagrees with Digicel's view that for demand modelling purposes, it should use 1/N instead of the market share of the reference operator. While a 1/N (33.33% in the case of PNG) approach would be appropriate in countries where the market is more or less evenly divided between operators, that is not the case in PNG. Indeed, PNG's market structure is exceedingly concentrated. Therefore, NICTA rejects the use of 1/N (33.33%) market share for modelling purposes of the notional or reference operator. If anything, the reference operator's demand would need to reflect the forward-looking demand for the operator. On the other hand, assigning Digicel's current estimated market share of voice traffic may overestimate the forward-looking demand of the reference operator in the cost model. NICTA therefore seeks to find a middle ground between those two options. Therefore, for modelling the demand of the reference operator, NICTA will consider a market share to be lower than Digicel's current market share, but higher than 1/N.

81. Question 12: NICTA is in agreement with both Telikom and Vodafone to model the FTAS using the network coverage of Telikom as the coverage of the reference operator. Similarly, for calculating the demand of the reference operator, NICTA is in agreement with their view to use the market share of Telikom (100%) because it is the sole provider of fixed line service.

7.3 NICTA's conclusions – Question 10, 11 and 12

82. NICTA will develop two separate cost models, one for the MTAS reference operator, and a different one for the FTAS reference operator. For the avoidance of doubt, NICTA will use the cost model results to set symmetrical MTAS rates.

83. NICTA's MTAS cost model will use a network coverage equivalent to that of Digicel's. With respect to the demand of the modelled reference operator, NICTA will use a market share lower than Digicel's current market share by volume, but higher than 1/N.

84. Regarding the FTAS cost model, NICTA will model the network coverage of the reference operator based on Telikom's network coverage and using a market share of 100% of the FTAS traffic.

8 Comments and Responses to Comments - Questions 13 and 14

Question 13: In the context of the cost model to set the price for MTAS, do you agree that NICTA should define the relevant incremental service as the MTAS provided to third parties? Please explain your reasons for why or why not.

Question 14: In the context of the cost model to set the price for FTAS, do you agree that NICTA should define the relevant incremental service as the FTAS provided to third parties? Please explain your reasons for why or why not.

8.1 Comments received from interested parties

85. All three operators agree with NICTA on the MTAS and FTAS definition.

8.2 NICTA's conclusions – Question 13 and 14

86. For cost modelling purposes, NICTA shall us the relevant incremental services as the MTAS (or FTAS) provided to third parties.

9 Comments and Responses to Comments - Question 15

Question 15: In reference to the DMTAS cost model; do you agree with the proposed technologies and services to model? Explain why or why not.

i. Technologies:
    a. GSM (2G): voice, data, SMS
    b. UMTS/HSPA (3G): voice, data, SMS
    c. LTE (4G): voice (VoLTE), data

ii. Modelled Services:
    a. Voice: On-Net, Incoming, Outgoing, International calls
    b. Data

Modelled service increment: Wholesale domestic mobile voice call termination provided to third parties.

9.1 Comments received from interested parties

87. Telikom is in agreement with the proposed services and technologies to be modelled. Vodafone pointed out the need to include all services demands on the modelled services facilities. Vodafone also expressed concerns that services such as MMS, or USSD are excluded and expressed concerns that the cost model risks over allocating the common and joint costs to the services that are included.

9.2 NICTA's responses to comments received on question 15

88. NICTA acknowledges Vodafone's concerns and agrees with Vodafone's views to include all services demands in the modelled facilities. MMS or USSD can be included if differentiated traffic information for each service is supplied by the access providers. Otherwise, these services would be included as data services.

9.3 NICTA's conclusions – Question 15

89. NICTA shall endeavour to include all the services demands in the DMTAS cost model. In particular, NICTA shall model the following technologies and

    services:

    a. GSM (2G): voice, data, SMS
    b. UMTS/HSPA (3G): voice, data, SMS
    c. LTE (4G): voice (VoLTE), data

90. Modelled Services:

    a. Voice: On-Net, Incoming, Outgoing, International calls
    b. Data

10 Comments and Responses to Comments - Question 16

Question 16. In reference to the FTAS cost model, do you agree with the proposed technologies and services to model? Explain why or why not.

i. Technology: Next Generation Network (NGN)
    a. Copper Access Network (ADSL)
    b. Fibre Access Network (PON)

ii. Modelled Services:
    a. Voice: On-Net, Incoming, Outgoing, International calls
    b. Data: Fixed internet service
    c. Video: Cable TV

Modelled service increment: Wholesale domestic fixed voice call termination provided to third parties.

10.1 Comments received from interested parties

91. Telikom is in agreement with the proposed services and technologies to be modelled.
92. Vodafone pointed out that under a fixed network LRIC+ approach, core and access networks are treated as separate increments. This distinction is normally reflected in fixed network's operator pricing where access capacity (number of lines, bandwidth) is charged separately from usage (minutes, megabytes). Vodafone also pointed out that the fixed network model needs to encompass the capacity demand of all services that use the core network but does not need to generate separate costs for them.

10.2 NICTA's responses to comments received on question 16

93. NICTA is in agreement with Vodafone's view on the different treatment to be given for access and transport/core increments. NICTA will apply similar cost allocation rules for all services that use the core network as those for the mobile cost model.

10.3 NICTA's conclusions – Question 16

94. NICTA shall endeavour to include all the service demands in the FTAS cost model. NICTA shall model the following technologies and services:
    Technology: Next Generation Network (NGN)
    a. Copper Access Network (ADSL)
    b. Fibre Access Network (PON)
95. Modelled Services:
    a. Voice: On-Net, Incoming, Outgoing, International calls
    b. Data: Fixed internet service
    c. Video: Cable TV
96. Modelled service increment:
    a. Access Network: Subscribers
    b. Transport/core Network: Traffic demand

11 Comments and Responses to Comments - Questions 17 and 18

Question 17: Do you agree that for the allocation of network related joint and common costs, NICTA should use the capacity-based allocation and the Shapley-Shubik approaches depending on the network element analysed? Please explain your reasons for why or why not.

Question 18: Do you agree that for the allocation of overhead common costs, NICTA should use the equal proportionate mark-up (EPMU) approach? Please explain your reasons for why or why not.

11.1 Comments received from interested parties

97. Questions 17 and 18: Telikom agrees with NICTA in principle with both proposals. On the other hand, Vodafone expressed concerns and doubts about the transparency in the Shapley-Shubik approach. Vodafone proposed to use a capacity-based approach for fixed joint network costs, which is in their view, more transparent and considered international best practice. In addition, Vodafone agrees with NICTA's proposal to use EPMU approach for the allocation of overhead common costs.

11.2 NICTA's responses to comments received on questions 17 and 18

98. NICTA sympathises with Vodafone's view that it should use the capacity-based allocation approach for network related joint and common costs. However, in some particular cases, like the copper access network for fixed services, a Shapley-Shubick approach would be a better method for common costs allocation between voice and data services.

11.3 NICTA's conclusions – Question 17 and Q18

99. For the allocation of network related joint and common costs, NICTA will use the Shapley-Shubik approach for certain incremental services in case the capacity-based allocation proves inadequate. Otherwise, the capacity-based allocation approach shall be used.

100. NICTA will implement the EMPU approach for the allocation of overhead common costs.

12 Comments and Responses to Comments - Question 19

Question 19: Do you agree that NICTA should use the tilted annuity approach to calculate the depreciation of assets? Please explain your reasons for why or why not.

12.1 Comments received from interested parties

101. Telikom and Vodafone are in agreement with NICTA's proposal.

12.2 NICTA's conclusions – Question 19

102. NICTA will use the tilted annuity approach to calculate the depreciation of assets.

13 Comments and Responses to Comments - Questions 20 and 21

Question 20: Do you agree that NICTA should use the after-tax and pre-tax WACC formulas presented earlier to calculate two separate costs of capital; one for the MTAS modelled access provider and a different for the FTAS modelled access provider? Please explain your reasons for why or why not.

Question 21: Do you agree that NICTA should not use the gearing values from the financial statements of the domestic operators, and that instead, should calculate notional gearing values based on international benchmarks from telecom companies that can be regarded as having an efficient capital structure? Please explain your reasons for why or why not.

13.1 Comments received from interested parties

103. Questions 20 and 21: Telikom agrees in principle, and Vodafone also agrees with the proposed approaches.

104. Question 20: Digicel pointed out that the WACC should be calculated in a pre-tax basis to allow the access provider to be compensated for the cost of taxation in PNG. In addition, Digicel did not address the specific question 21 but provided a general statement indicating that the calculated WACC should reflect the WACC of the modelled operator in PNG, which we interpreted as the WACC of the reference or notional operator. Digicel also added that to the extent possible, any derived information should reflect the risk profile and circumstances that exists in PNG.

13.2 NICTA's responses to comments received on questions 20 and 21

105. NICTA is pleased that commenters appear to agree with our proposed approach in Question 20.

106. However, with regard to Question 21, and in particular with respect to the FTAS reference or notional operator, NICTA does not think it would be appropriate to use the gearing ratio of the sole provider, Telikom, because being a state-owned enterprise, its capital structure is likely influenced by political considerations. For this reason, the gearing ratio in the FTAS model should be based on international benchmarks to assign a reasonable capital structure to the modelled reference operator. On the other hand, for the MTAS model, adopting a reasonable gearing ratio would be more straight forward given that Digicel and Vodafone's parent companies are well-known publicly traded international telecommunications operators.

13.3 NICTA's conclusions – Questions 20 and 21

107. NICTA shall use the pre-tax WACC formula presented in the Discussion Paper to calculate two separate costs of capital; one for the MTAS modelled access provider and a different WACC for the FTAS model.

108. For the gearing ratio of the FTAS reference or notional operator modelled, NICTA shall use a gearing ratio that reflects a reasonably efficient capital structure and not the capital structure of the sole access provider, Telikom. Therefore, NICTA

shall adopt a gearing ratio to reflect an efficient capital structure informed by benchmarking international operators that provide similar access services.

109. For the gearing ratio of the MTAS, NICTA shall use a notional gearing ratio to reflect the capital structure of Digicel and Vodafone, or their respective parent companies, or international benchmarking of comparable mobile operators.

14 Comments and Responses to Comments - Questions 22 through 25

Question 22: Do you agree that NICTA should use formula No. 6 to calculate the cost of debt of the modelled access provider of FTAS and MTAS? Please explain your reasons for why or why not.

Question 23: Do you agree that NICTA should use the interest rate on a 10-year U.S. bond or comparable sovereign bond interest rate, as the risk-free rate of return? Please explain your reasons for why or why not.

Question 24: Do you agree that to calculate the country risk premium (CRP) NICTA should use either the difference between the interest rate of the PNG government bonds and the risk-free interest rate of comparable maturity, or the widely used CRP calculated by Prof. Damodaran from NYU? Please explain your reasons for why or why not.

Question 25: To calculate the debt-risk premium, do you agree that NICTA should use the spread between the interest rate of comparable corporate bonds and government bonds in other jurisdictions, as long as the corporate bonds are from efficient operators that provide comparable services as the modelled operator? Please explain your reasons for why or why not.

14.1 Comments received from interested parties

110. Telikom expressed support to NICTA's approach in all these questions.

111. Questions 22 and 23: Vodafone expressed agreement with NICTA's approach.

112. Question 24: Vodafone favoured using Prof. Damodaran's estimate of the CRP rather than the difference between the interest rate of the PNG government bonds and the risk- free interest rate of comparable maturity.

113. Question 25: Vodafone pointed out that since the notional operator has no corporate bonds outstanding, the data would not be available to implement NICTA's approach to calculate the debt-risk premium. Instead, Vodafone proposes using the debt-risk premium estimates from Prof. Damodaran.

14.2 NICTA's responses to comments received on questions 22 through 25

114. Questions 22 and 23: NICTA is glad that the comments received were in favour of NICTA's proposed approach.

115. Question 24: NICTA sympathises with Vodafone's preference for using Prof. Damodaran's calculated CRP which has been used by other national regulatory

authorities. However, conceptually, the CRP estimates from Prof. Damodaran are calculated by finding the difference (spread) between the interest rate of the PNG government bond and the risk-free interest rate for a bond of comparable maturity. Therefore, either approach should lead to similar results. Of course, the source for the interest rates may vary which may lead to slight differences in the results. All in all, NICTA is in agreement that Prof. Damodaran estimates of the CRP for PNG would be appropriate, unless there are compelling reasons for not using that estimate. In such case, NICTA would compute the CRP using the alternative approach described.

116. Question 25: NICTA agrees with Vodafone that the modelled reference access provider would not have corporate bonds outstanding. NICTA intended to point out the conceptual approach to be used. How this is implemented can vary, but what is clear is that NICTA would need to benchmark the debt-risk premium of the modelled access provider against appropriate international telecom operators to come up with a reasonable estimate of the debt-risk premium. What Vodafone pointed out is that NICTA may not need to do a benchmark analysis itself but instead use the estimated debt-risk premium calculated by Prof. Damodaran for telecom companies. NICTA agrees that that would be appropriate unless we find out that there are compelling reasons for doing our own benchmarking of debt-risk premiums on a sample of appropriate telecom companies.

14.3 NICTA's conclusions – Questions 22 through 25

117. NICTA should use the following formula to calculate the cost of debt of the modelled reference access provider of the FTAS and the MTAS:

$$r_d = r_f + CRP + D_p,$$

where,

r_d: cost of debt,

r_f: risk-free rate of return

CRP: country risk premium, and

D_p: Debt-risk premium.

118. NICTA will use the interest rate on a 10-year U.S. bond or comparable sovereign bond interest rate, as the risk-free rate of return.

119. NICTA will use Prof. Damodaran's estimate of the CRP for PNG, unless there are compelling reasons for not using this estimate. In such a case, NICTA shall compute the CRP using the difference (spread) between the interest rate of the PNG government bond and the risk-free interest rate for a bond of comparable maturity.

120. To calculate the debt-risk premium of the modelled reference access provider, NICTA will use the estimated debt-risk premium calculated by Prof. Damodaran for telecom companies, unless there are compelling reasons for doing our own benchmarking of debt-risk premiums on a sample of appropriate telecom companies.

15 Comments and Responses to Comments - Questions 26 through 28

Question 26: Do you agree that NICTA should use formula No. 8 to calculate the cost of equity capital for the modelled access provider of FTAS and MTAS? Please explain your reasons for why or why not.

Question 27: Do you agree that to calculate the market-risk premium (MRP), NICTA should use the difference between the rate of return on the U.S. Standard & Poor's 500 Index and the risk-free rate of return? Please explain your reasons for why or why not.

Question 28: Do you agree that to calculate the equity beta of the modelled access provider NICTA should either use benchmarks of equity betas from comparable publicly traded companies in the U.S or use the widely cited estimates from the U.S. telecommunications sector from Prof. Damodaran? Please explain your reasons for why or why not.

15.1 Comments received from interested parties

121. Telikom expressed support for NICTA's approach in all three questions.

122. Question 26: Vodafone agrees with NICTA's proposed use of equation 8 in the Discussion Paper to calculate the cost of equity capital for the modelled reference access provider of FTAS and MTAS.

123. Question 27: Vodafone agrees with the proposed approach to estimate the market risk premium (MRP) as the difference between the rate of return of the U.S. Standard & Poor's 500 Index and the risk-free rate of return. However, it added that it sees little point in having NICTA calculate such difference given that Prof. Damodaran have already done so over a long period of time, suggesting that NICTA should use those results instead.

124. Question 28: Vodafone seems to agree with NICTA's general proposed approach of either calculating the equity beta of the modelled reference access provider based on a benchmark analysis using publicly traded telecommunications companies or using the estimates from Prof Damodaran from the U.S. telecom sector. However, Vodafone then points out that they disagree with using data from telecom companies traded on US stock markets alone. Vodafone didn't elaborate further on its views.

15.2 NICTA's responses to comments received on questions 26 through 28

125. Question 26: There seems to be a general agreement that NICTA should use formula No. 8 to calculate the cost of equity capital for the modelled referenced access providers of FTAS and MTAS.

126. Question 27: NICTA is sympathetic with Vodafone's view that NICTA should use Prof. Damodaran's calculation of the MRP instead of calculating it. However, NICTA maintains that the general approach to calculate the MRP as the difference

between the rate of return on the U.S. Standard & Poor's 500 Index and the risk-free rate of return was used by Prof. Damodaran.

127. Question 28: Again, NICTA is sympathetic with Vodafone's view. However, the general approach of benchmarking the equity betas of telecom companies to estimate the equity beta of the modelled notional access provider is the same approach used by Prof. Damodaran. The only point of contention between Vodafone's view and our proposed approach seems to be the sample of firms used by Prof. Damodaran. While we think it would be appropriate to use the beta estimates from the U.S. telecom sector calculated by Prof. Damodaran, we are open to us the beta estimates from Prof. Damodaran from telecom companies in other regions such as Oceania, Australia, or the Pacific region, if data is available.

15.3 NICTA's conclusions – Questions 26 through 28

128. NICTA will use the following formula to calculate the cost of equity capital for the modelled reference access providers of FTAS and MTAS:

$$r_e = r_f + \beta \, x \, (MRP + CRP),$$

Where,

r_e: is the cost of equity capital,

r_f: risk-free rate of return,

β: equity beta,

MRP: Market risk premium, and

CRP: Country risk premium.

129. NICTA will use the difference between the rate of return on the U.S. Standard & Poor's 500 Index and the risk-free rate of return as the general approach to calculate the market-risk premium (MRP). However, to implement this approach, NICTA could use Prof. Damodaran's calculation of the MRP.

130. NICTA will benchmark the equity betas of publicly traded telecom companies in other jurisdictions as the general approach to calculate the equity beta of the modelled reference access provider. However, to implement this, NICTA will use Prof. Damodaran estimated equity betas from publicly traded companies in the telecom sector from Australia, or countries in Oceania, if data is available; otherwise, beta values from publicly traded companies in the U.S. will be used.

16. Comments and Responses to Comments Received from Digicel Unrelated to Any Particular Question

131. Aside from comments specific to the questions NICTA posed in the Discussion Paper, Digicel used paragraphs 4 through 21, and paragraph 26 (Section B) of its

submission to challenge more generally NICTA's public inquiry and views expressed in the Discussion Paper. Below we summarize Digicel's comments and our responses.

16.1 Comments in paragraphs 5 through 8 of Digicel's submission

132. Digicel indicates that the terms used in the Wholesale Declaration No. 1 of 2023 (the "Declaration") are quite prescriptive. For example, Digicel points out that the Declaration says that access providers shall set prices in accordance with the GPPs. According to Digicel, the use of the term "shall" raise a serious question as to whether or not NICTA may use any other pricing principles other than the GPPs. In essence, Digicel appears to question the authority of NICTA to adopt a Service-specific Pricing Principles (SSPPs) for the Declared Services.

16.2 NICTA's responses to comments

133. Firstly, the use of the term "shall" in the Declaration does not preclude NICTA from adopting more specific pricing principles for the Declared Services, as long as the SSPPs are consistent with the GPPs. This is clear from Section 134 (3) of the Act which requires the SSPPs to be consistent with the GPPs. In essence the GPPs provide overarching principles while the SSPPs can provide more detailed principles, price and non-price terms and conditions for the supply of the Declared Services.

134. Secondly, while the Declaration is valid, it remains a legal document subordinate to the Act, and the Act can still be used to introduce the SSPPs. The provisions are meant to be read collectively. This means while NICTA has the power to set SSPPs, we are bound by Section 124 to ensure the SSPPs attain the competition and efficiency objectives of the Act, that they are reasonable pursuant to Section 126, and that they do not exceed what is provided for under the GPPs under Section 134.

16.3 Comments in paragraphs 9 through 12 of Digicel's submission

135. Digicel expressed surprise that the Discussion Paper does not mention two 2011 SSPPs for the MTAS and FTAS. Furthermore, Digicel seems to suggest that such determinations (long expired) are in force by calling them "existing SSPPs", and suggesting that the "existing SSPPs" may be relevant to the determination of prices for the Declared Services. Digicel bases its assertion by citing NICTA's website that describes the SSPP as being in force.

136. Digicel then goes on to reiterate its view that these SSPPs are in force by stating that it "*has no objection to NICTA undertaking a review of the existing SSPPs*."

16.4 NICTA's responses to comments

137. Section 135(5) of the Act is very clear that a SSPP determination ceases to be in force on the date of expiration of the associated declaration. Per Schedule 1 of the Act, the related deemed declarations expired on 31 December 2014; that was more than 10 years ago.

16.5 Comments in paragraphs 13 through 15 of Digicel's submission

138. Digicel states that the Act does not provide NICTA with an express power to set the actual price (or maximum price) of the Declared Services. It goes on to quote Section 135(2) of the Act indicating it only permits the SSPPs to "contain price related terms and conditions (whether relating to a price or the method of ascertaining a price) and non-price related terms and conditions…"

16.6 NICTA's responses to comments

139. Digicel appears to advance an argument that SSPPs can only include the principles or method to be used to set a price but cannot set a price (or maximum allowable price) for the FTAS and/or MTAS. However, Section 135(2) that Digicel quotes, clearly states that SSPPs can set a price. Moreover, Section 135(2) introduces a clarification by way of a text in parenthesis specifying that the price related terms and conditions (in a SSPP) can relate to the price or the method of setting prices. This further clarification cannot be ignored as it clearly shows that SSPPs can set the price of a declared service. Incidentally, there is a precedent where the SSPPs (Submarine Cable Services) Determination 2019 set a maximum price for a declared service.

16.7 Comments in paragraphs 16 and 17 of Digicel's submission

140. Digicel refers to Section 133 of the Act which gives power to NICTA to set "model terms" for declared services. Section 133 says that the model terms shall only set non-price terms and conditions for access to the declared services. Digicel seems to emphasize the non-price aspect of these "model terms".

141. Next, Digicel quotes partially Section 135 (6) that says that NICTA shall have regard to any SSPP for a declared service if it is required to arbitrate an access dispute.

142. Finally, it appears that Digicel attempts to connect those two sections by jumping to the conclusion that Section 135 "is not intended to elevate the SSPPS to becoming the sole mechanism relied upon by NICTA for setting access prices."

16.8 NICTA's responses to comments

143. Digicel appears to aim at using different parts of these two sections to bolster its argument that SSPPs cannot set maximum prices for declared services. Digicel then makes a logical leap to conclude that SSPPs are not intended to be the sole mechanisms to be relied to for setting access prices. This last part seems uncontroversial, and we agree with Digicel. For more than 10 years NICTA has been relying on commercial negotiations between operators to set the price of access to the MTAS and FTAS. In addition, the Act provides a second mechanism by way of an access dispute (Division 6 of Part VI). A third mechanism is via a declaration and subsequent SSPPs which is what NICTA intends to do.

144. Section 133 of the Act cited by Digicel is yet another option the Act provides for regulating the terms and conditions for the supply of declared services, but it is limited to non-price terms only. NICTA has opted to use Section 135.

145. The argument that SSPPs cannot set maximum prices was already addressed earlier.

16.9 Comments in paragraphs 18 through 21 of Digicel's submission

146. In para. 18 Digicel quotes Section 149 of the Act which relates to matters that NICTA shall consider when making a final determination in the context of an access dispute. Then, in para. 19 Digicel makes reference to Section 143 of the Act which stipulates the conditions and procedure to notify NICTA in the event of an access dispute. Digicel states that it is not aware of an access dispute being notified to NICTA with respect to the declared services, adding that no cogent evidence or analysis have been provided by NICTA that indicates that the MTAS and FTAS have been or are materially inconsistent with the GPPs or the "existing" SSPPs. In conclusion, Digicel states that NICTA should refrain from setting maximum allowable prices for the declared services.

16.10 NICTA's responses to comments

147. Digicel is taking sections of the Act that explain the way NICTA and licensed operators should handle and resolve access disputes. Digicel seems to view NICTA's power under the Act as being reactive to access disputes only. Digicel seem to ignore that NICTA can initiate pursuant to Section 230(1) a public inquiry on its own accord, on matters related to the performance of any of NICTA's functions and powers. NICTA has the power to initiate a public inquiry to determine SSPPs for the Declared Services; a recent example are the SSPPs for (Submarine Cable Services) Determination 2019.

148. Digicel's states that no cogent evidence or analysis have been provided by NICTA that indicates that the MTAS and FTAS have been or are materially inconsistent with the GPPs or the "existing" SSPPs, seem out of place. Firstly, during the public inquiry that concluded with the declaration of the Declared Services (Wholesale Declaration No. 1 of 2023), NICTA undertook a thorough analysis with related evidence to justify the need for a declaration of the wholesale services.[10]

149. Second, per Section 134 (3) the SSPPs for the Declared Services requires NICTA to ensure that these are consistent with the GPPs. The Act does not require NICTA to show that the current MTAS and FTAS have been or are materially inconsistent with the GPPs. As indicated above, during the public inquiry that concluded with the Wholesale Declaration No. 1 of 2023, NICTA provided a cogent analysis and evidence to justify the declaration of these wholesale services.

[10] See NICTA, Recommendation Report. A Report to the Minister recommending the declaration of Domestic Mobile and Fixed Termination Access Services under Division 3, Part VI of the NICTA Act 209. Issued 3 Nov. 2023. https://www.nicta.gov.pg/pi-0-4/

150. Thirdly, Digicel's use of the term "existing SSPPs" is misleading as the SSPPs Digicel refers to, expired more than 10 years ago.

16.11 Comments in paragraph 26 of Digicel's submission

151. Digicel states that any SSPP determination would also be required to take into account and deal with the matters specified in Sections 147-149 of the Act.

16.12 NICTA's responses to comments

152. This comment seems out of place because Sections 147-149 of the Act are provisions in the Act that deal with a determination resulting from an access dispute, which is not relevant for this public inquiry into the SSPPs for the Declared Services.

ANNEX A. DRAFT PARTIAL DETERMINATION – METHODOLOGY

DRAFT PARTIAL SERVICE-SPECIFIC PRICING PRINCIPLES FOR MOBILE AND FIXED TERMINATING ACCESS SERVICES DETERMINATION 2025

National Information and Communications Technology Act 2009

THE NATIONAL INFORMATION AND COMMUNICATIONS TECHNOLOGY AUTHORITY makes this Determination under section 135 of the *National Information and Communications Technology Act 2009*.

Dated [xxx, 2025]

[Name]

[Signature]

Member

[Name]

[Signature]

Member

National Information and Communications Technology Authority

PART I – PRELIMINARY

1 Name of Determination

This Determination is the *Service-Specific Pricing Principles for Mobile Terminating Access Services and Fixed Terminating Access Services Determination 2025*

2 Commencement

(1) This Determination commences on [XX, Month 2025] (***the Commencement Date***).

3 Interpretation

(1) Subject to subsection (2), unless the context otherwise requires, terms used in this Determination have the same meaning as in the Act.

(2) In this Determination, unless the context in Part II – Pricing Principles, otherwise requires:

(a) ***"Act"*** means the *National Information and Communications Technology Act, 2009*.

(b) ***"Bottom-up Cost Models"*** are:

(i) Models that use data on demand, network coverage, geographic and technical information to dimension the required network to serve the geographic coverage area with the required capacity and technology. The underlying technical engineering model of a network is used to develop unit costs of various network components. These costs are then allocated to the various services supplied by the access provider.

(ii) These models tend to be more transparent and allow to perform scenario analysis and test the sensitivity of assumptions to a much larger degree than top-down models.

(c) ***"Declared Services"*** are – the domestic Fixed Terminating Access Service and the domestic Mobile Terminating Access Service.

(d) ***"Equity Beta"*** is the risk that a company or investment adds to a market portfolio. Intuitively, it measures the sensitivity of a company's rate of return on equity to changes on the market rate of return.

(e) ***"Fixed Terminating Access Service"*** means the wholesale service defined in Part III of the Wholesale Service Declaration No. 1 of 2023.

(f) ***"Gearing"*** is – the ratio of the debt to the total capital of a company (debt plus equity).

(g) ***"Hybrid Cost Models"*** are cost models where a Bottom-up Cost Model is used as the primary model to calculate the costs, and then a partial Top-down Cost Model is used only to fine-tune some of the assumptions in the bottom- up model.

(h) ***"Mobile Terminating Access Service"*** means the wholesale service defined in Part II of the Wholesale Service Declaration No. 1 of 2023.

(i) ***"Modern Equivalent Asset"*** means the lowest cost asset providing at least equivalent functionality and output as the asset being valued.

(j) ***"Top-down Cost Models"*** are:

(i) Cost models that use data from an access provider's accounts and allocation rules, to distribute the costs across the services supplied by the access provider. This approach does not involve detailed network modelling.

(ii) To avoid incorporating the access provider's inefficiencies, the model would need to adjust the accounting costs to reflect forward-looking (efficient) costs. This may require adjustments to the network configuration and costs in the model.

4 Determination

The National Information and Communications Technology Authority ("NICTA") determines, pursuant to Section 135 of the Act, that the service-specific pricing principles specified in Part II are to apply to the following services declared by the Minister in the Wholesale Service Declaration No.1 of 2023:

- Mobile Terminating Access Service, and
- Fixed Terminating Access Service.

PART II – PRICING PRINCIPLES

Division 1 – Methodology

5 Introduction

(1) NICTA outlines in this Division 1 of this service-specific pricing principles the applicable methodology to be used for calculating the efficient cost of providing the Declared Services.

(2) Division 2 of this service-specific pricing principles presents the results of applying this methodology to ascertain the cost-based prices of the Declared Services, along with related terms and conditions.

6 Appropriate approach to determine cost-based prices: International benchmarking or cost modelling

(1) In principle NICTA accepts that both approaches: cost modelling and benchmarking, could be regarded as being in accordance with the General Pricing Principles (GPP), and therefore, could be used to calculate the costs of supplying the domestic Mobile Terminating Access Service (MTAS) and the domestic Fixed Terminating Access Service (FTAS).

(2) However, the cost modelling approach provides greater accuracy for calculating PNG-specific efficient costs of supplying the Declared Services. Despite its greater data requirements and modelling time, NICTA will use that approach to calculate PNG-specific efficient costs of providing the Declared Services. For the avoidance of doubt, NICTA intends to model the costs of an efficient notional or reference access provider to come up with symmetrical MTAS and one single FTAS.

(3) NICTA may also use an international benchmark approach to compare the results with those from the cost modelling exercise. In addition, NICTA may use benchmarking to justify some of the cost assumptions that go as input in the cost models.

(4) Notwithstanding what is said elsewhere in this determination, if NICTA considers that the data received for developing a cost model is inadequate, or incomplete, NICTA may decide to use a benchmarking approach instead of a cost modelling approach, to calculate the cost-based prices of supplying the MTAS or FTAS.

7 Modelling approach: Top-down, bottom-up, or hybrid

(1) Modelling approach

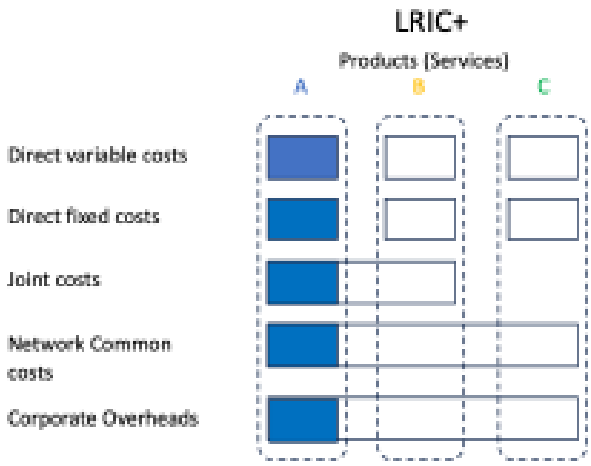
(a) In principle, NICTA could either use a bottom-up, a top-down, or a hybrid approach. However, a Hybrid Cost Model would more closely adhere to the GPP while at the same time advance the efficiency objective in Section 124 of the Act.

(b) The cost estimates of the Declared Services would come from a Bottom-up Cost Model. However, NICTA will use parts of a Top-down Cost Model to inform the various assumptions required for the Bottom-up Cost Model. NICTA will use not only cost data from the access providers but also benchmark those costs against international operators to come up with reasonable assumptions to be used in the Bottom-up Cost Model.

8 Approach for allocating costs

(1) NICTA will use a LRIC+ (also known as a TSLRIC+) cost allocation approach that includes fair and reasonable common and joint costs.

(2) Joint costs are the costs of an input that is used in the supply of two or more services. Common costs are the costs of certain inputs that are necessary for the supply of two or more services but that cannot be directly assigned to specific services. Common costs can be subdivided into network common costs and corporate overhead costs. The figure below illustrates the different categories of costs for an operator supplying three services.



9 Treatment of capital related costs

(1) NICTA will use current cost accounting (CCA) also known as forward-looking costs to value the capital assets used for the supply of the Declared Services. Specifically, NICTA will value the capital related costs by either (i) using the cost of replacement with the Modern Equivalent Asset, or (ii) use as the cost of replacement, the economic cost of the depreciated assets in use, or (iii) a combination of both.

10 Network topology for cost model

(1) Scorched node approach

(a) In the scorched node approach, the existing location of a reference operator's nodes are used to design the hypothetical network in the cost model. There is room for optimizing the hypothetical or notional network in the model, but it is constrained by the predetermined location of the network nodes. The resulting optimized network would have a similar footprint as the reference network.

(2) Scorched earth approach

(a) The scorched earth approach allows the cost model's hypothetical network to be optimized to the fullest extent by having no constrains on the location of the nodes. With this approach the cost model could place optimally the nodes to serve the required demand with an optimized network.

(3) Modified scorched node approach

(a) The modified scorched node approach is a combination of the prior two. With this method, the location of the nodes is based on the location of the reference operator's nodes but are not strictly fixed at the operator's locations. Locations may be modified or calibrated to optimize the real network.

(4) Approach to network topology in cost model

(a) To the extent permitted by the information provided by the access providers, NICTA will preferably use a scorched node approach. If the information provided is incomplete, NICTA will us a modified scorched node approach. If no or minimal information is provided, NICTA will use a scorched earth approach.

11 Reference or notional operator for the cost models

(1) NICTA will follow international best practice to set symmetrical termination rates, meaning one single rate for all access providers supplying the domestic MTAS. The same principle will apply to the provision of domestic FTAS.

(2) To the extent that information is available, two separate cost models will be used: one for the domestic MTAS and a separate for the FTAS. Each cost model will be based on a notional or hypothetical operator with a certain share of the total volume of voice traffic and a certain geographic coverage.

(3) Demand wise, the notional operator for the MTAS cost model will be assigned a market share to be lower than Digicel's current market share, but higher than an equally distributed market share, also known as 1/N.

(4) With respect to the network coverage, the notional operator for the MTAS cost model will be assigned a network coverage equivalent to that of Digicel.

(5) With respect to the FTAS cost model, the notional operator will be assigned a market share of 100% of the FTAS traffic, and a network coverage equivalent to that of Telikom's fixed network.

12 Service increment for the cost model

(1) For cost modelling purposes, NICTA shall us the relevant incremental services as the domestic MTAS and FTAS provided to third parties.

13 Technologies and services to model in the MTAS and FTAS cost models

(1) NICTA shall endeavour to include all the services' demands in the domestic MTAS cost model. In particular, NICTA shall model the following technologies and services:

(a) Technologies:

(i) GSM (2G): voice, data, SMS

(ii) UMTS/HSPA (3G): voice, data, SMS

(iii) LTE (4G): voice (VoLTE), data.

(b) Services to be modelled:

(i) Voice: On-Net, Incoming, Outgoing, International calls

(ii) Data.

(c) Modelled service increment units: Traffic demand

(2) NICTA shall endeavour to include all the services' demands in the domestic FTAS cost model. NICTA shall model the following technologies and services:

(a) Technology: Next Generation Network (NGN)

(i) Copper Access Network (ADSL)

(ii) Fibre Access Network (PON)

(b) Modelled services:

(i) Voice: On-Net, Incoming, Outgoing, International calls

(ii) Data: Fixed internet service

(iii) Video: Cable TV

(c) Modelled service increment units:

(i) Access Network: Subscribers

(ii) Transport/core Network: Traffic demand

14 Method to allocate joint and common costs to services

(1) For the allocation of network related joint and common costs, NICTA will use the Shapley-Shubik approach for certain incremental services in case the capacity-based allocation proves inadequate. Otherwise, the capacity-based allocation approach shall be used.

(2) NICTA will implement the equal proportionate mark-up (EPMU) approach for the allocation of overhead common costs.

15 Depreciation

(1) NICTA will use the tilted annuity approach to calculate the depreciation of assets.

16 Approach to determine a reasonable rate of return

(1) NICTA shall use the pre-tax WACC formula below to calculate two separate costs of capital: one for the domestic MTAS and another WACC for the FTAS model.

$$Pre - tax\ WACC = \frac{After-tax\ WACC}{(1-t)},$$

Where the after-tax WACC is:

$$WACC = \left(\frac{E}{E+D}\right) x\ r_e + \left(\frac{D}{E+D}\right) x\ (1-t)\ x\ r_d\ ,$$

where,

r_e: cost of equity capital or shareholder's expected return on equity,

r_d: cost of debt,

E: Equity of the operator's capital structure,

D: Debt of the operator's capital structure, and

t: corporate tax rate.

(2) For the Gearing ratio of the FTAS model, NICTA shall use a Gearing ratio that reflects a reasonably efficient capital structure and not the capital structure of the sole access provider, Telikom. To that end, NICTA shall use a Gearing ratio informed by benchmarking telecom operators from the U.S., Australia, or comparable jurisdictions, that can be regarded as having an efficient capital structure. Alternatively, NICTA could use Gearing ratios from telecom service providers from the U.S., Australia, and comparable jurisdictions, as reported by Professor Damodaran in the extensive database that he regularly updates.[11]

(3) For the Gearing ratio of the MTAS model, NICTA shall use a notional Gearing ratio to reflect the capital structure of Digicel and Vodafone's respective parent companies, and any other comparable mobile operator. Alternatively, NICTA could use Gearing ratios from telecom service providers from the U.S., Australia, and comparable jurisdictions, as reported in Professor Damodaran's open database.

(4) NICTA will use the following formula to calculate the cost of debt of the modelled notional access provider of FTAS and MTAS:

[11] Prof. Damodaran is a world-renowned authority on the valuation of financial assets and accompanies. He is a professor of finance at the Stern School of Business at New York University (NYU).

$$r_d = r_f + CRP + D_p,$$

where,

r_d: cost of debt,

r_f: risk-free rate of return

CRP: country risk premium, and

D_p: Debt-risk premium.

(5) NICTA will use the interest rate on a 10-year U.S. bond or comparable sovereign bond interest rate, as the risk-free rate of return.

(6) NICTA will either use Prof. Damodaran's estimate of the CRP for PNG or compute the CRP using the difference (spread) between the interest rate of the PNG government bond and the risk-free interest rate for a bond of comparable maturity.

(7) To calculate the debt-risk premium (D_p) in the above formula, NICTA will either use the difference between the cost of debt and the risk-free rate of return from telecom companies in the U.S., Australia, or comparable jurisdictions, as reported by Professor Damodaran, or benchmark debt-risk premiums on a sample of appropriate telecom companies.

(8) NICTA will use the following formula to calculate the cost of equity capital for the modelled notional access providers of FTAS and MTAS:

$$r_e = r_f + \beta \, x \, (MRP + CRP),$$

Where,

r_e: is the cost of equity capital,

r_f : risk-free rate of return,

β: equity beta,

MRP: Market risk premium, and

CRP: Country risk premium.

(9) NICTA will use the difference between the rate of return on the U.S. Standard & Poor's 500 Index and the risk-free rate of return as the general approach to calculate the market-risk premium (MRP). However, to implement this approach, NICTA could use Prof. Damodaran's calculation of the MRP.

(10) NICTA will benchmark the Equity Betas of publicly traded telecom companies in other jurisdictions as the general approach to calculate the Equity Beta of the

modelled notional access provider. However, to implement this, NICTA will use Prof. Damodaran estimated Equity Betas from publicly traded telecom companies from the U.S., Australia, or comparable countries.

Division 2 – Price related terms and conditions

[TBD in second phase]

*****