Public Inquiry
into the need for a
Retail Service Determination
regarding certain
mobile telephony services

SECOND DISCUSSION PAPER

Issued on 4th May 2012

Contents

1 Executive Summary

The *National Information and Communications Technology Act 2009* (the Act) provides for NICTA to conduct a public inquiry into whether or not particular retail services should be subject to a retail service determination. A retail service determination is a regulation that is made by the Minister, based on a recommendation from NICTA, which can specify the retail pricing, service standards or pricing principles in relation to the supply of a particular retail service.

In November 2011, NICTA decided to initiate a public inquiry into the possible need for a retail service determination regarding certain mobile telephony services supplied by Digicel (PNG) Limited (Digicel). NICTA's decision followed the receipt of a complaint by bemobile (PNG) Limited (bemobile) regarding the pricing of Digicel's off-net mobile calls and SMS.

This is the second discussion paper issued as part of that inquiry and sets out the findings and proposed conclusions of NICTA staff based on their consideration of the responses to the first discussion paper (including cross-submissions), their further research and analysis of the matters raised in those submissions, and their analysis of data specifically requested from bemobile, Digicel and Telikom PNG Limited (Telikom).

NICTA staff have issued a separate report setting out specific responses to the issues raised in the submissions to the first discussion paper that have not been addressed as part of this second discussion paper. That Response to Consultation Report is available from NICTA's Public Register and NICTA staff would encourage respondents to take note of NICTA staff's comments in that report in the preparation of any responses to this second discussion paper

For reasons explained in this discussion paper, NICTA staff propose to make the following conclusions:

(a) The relevant market is the national market for retail mobile services, which comprises mobile access and national mobile call origination, includes SMS and MMS, but excludes fixed telephony access and services and mobile data services;
(b) The retail mobile services market is susceptible to ex ante competition regulation;
(c) Digicel has a substantial degree of power in the retail mobile services market and, in the absence of ex ante regulation, that position is likely to endure over the forthcoming two years at least;
(d) Digicel's substantial degree of power in the retail mobile services market gives it the incentive and the ability to price discriminate between on-net and off-net mobile calls in a manner that increases the barriers to entry and/or expansion, fosters customer lock-in and, in turn, risks leading to the foreclosure of the market to competition;
(e) It is appropriate for NICTA to consider making a retail service determination that establishes a pricing principle that prevents discrimination between on-net and off-

net prices except to the extent that any such differences are objectively justifiable based on differences in costs; and

(f) The proposed retail service determination at Annex C, which establishes a non-discrimination pricing principle applicable to Digicel's supply of mobile originated national retail voice call services, satisfies the retail regulation criteria specified in section 158 of the Act.

NICTA invites interested parties to submit written comments in response to the specific questions and general issues raised in this discussion paper. Submissions should be supported with evidence and data, particularly if respondents have a different interpretation or view of something from that of NICTA staff. Submissions should be submitted via email to inquiry.submission@nicta.gov.pg and **must be received by 12 noon Friday 1st June 2012.** Copies of all submissions received will be published on NICTA's Public Register consistent with the requirements on NICTA under subsection 229(3) of the Act (subject to NICTA's consideration of any claims for confidentiality over specific elements of those submissions pursuant to section 44 of the Act).

2 Background

2.1 Summary

This chapter provides background and contextual information about the present inquiry, the inquiry process, and how to make a submission in response to this discussion paper. It also provides a brief explanation of tariff mediated network externalities, which is a subject considered throughout this discussion paper.

2.2 Retail Service Determinations

Part VII of the *National Information and Communications Technology Act 2009* (the Act) sets out special arrangements relating to consumer protection and the regulation of retail pricing. Under section 157 of the Act, NICTA is able to hold a public inquiry under section 230 of the Act to determine whether or not it should recommend to the Minister that one or more particular retail services supplied by one or more specified operator licensees should be subject to a retail service determination.

A retail service determination is a regulation that is made by the Minister based on the recommendation of NICTA. NICTA's recommendation must be based on application of the retail regulation criteria that are set out in Section 158 of the Act are as follows:

> (*a*) that making a retail service determination for the retail service in respect of an operator licensee for a particular period will further the achievement of the objective set out in section 124 but disregarding section 124(2); and
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> (*b*) specifically, in relation to the competition objective, that –
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> (i) that operator licensee has a substantial degree of power in the market within which the retail service is supplied; and
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> (ii) in the absence of the retail service determination for that period, that substantial degree of power is likely to –
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> (A) persist in the market over that period; and
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> (B) expose retail customers to a material risk of higher prices and/or reduced service where they acquire the retail service from that operator licensee during that period; and
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> (*c*) specifically, in relation to the efficiency objective, that the operator licensee will not be prevented from achieving a return on assets during that period sufficient to sustain investment necessary to supply the retail service; and

(*d*) the aggregate likely benefits of making that retail service determination outweigh any aggregate likely detriments.[1]

These criteria will be considered in detail later in this discussion paper.

The specific things that a retail service determination may specify are set out in section 161 of the Act and considered in detail later in this discussion paper (in section 7.2). In summary however, section 161:

- Requires that a retail service determination must specify the operator licensee to which it refers (and may apply to more than on operator licensee);[2]
- Provides that a retail service determination may
  - regulate prices for the supply of the retail service;[3]
  - specify service standards that the operator licensee supplying the retail service must meet;[4]
  - specify any pricing policies and/or principles that must be complied with by the operator licensee in pricing the retail service;[5]
  - specify conditions relating to the price of the retail service, including that any calculation is to be performed, or a matter is to be determined, by NICTA;[6] or
  - require the operator licensee to provide specified information to NICTA, retail customers, or any other persons;[7]
  - require the operator licensee to supply the retail service in particular areas or to particular classes of retail customer;[8] and/or
  - require the operator licensee to comply with any terms and conditions advised by NICTA that NICTA considers are necessary or desirable to give effect to any of the matters listed [in the section];[9]
- Provides that in relation to retail service price regulation, that the retail service determination may do many things including fixing a price, determining price increases and decreases, determining indices, regulating revenue outcomes, and requiring approvals on a periodic basis. [10]

The Act therefore gives very wide scope to the matters that NICTA may include in a retail price determination. A determination may not have retrospective effect.[11]

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[1] Section 158 of the Act

[2] Sub-section161(1) of the Act

[3] Paragraph161(2)(a) of the Act

[4] Paragraph 161(2)(b) of the Act

[5] Paragraph 161(2)(c) of the Act

[6] Paragraph 161(2)(d) of the Act

[7] Paragraph 161(2)(e) of the Act

[8] Paragraph 161(2)(f) of the Act

[9] Paragraph 161(2)(g) of the Act

[10] Paragraph 161(2)(a) of the Act

[11] Sub-section 161(3) of the Act

The matters to be included in a retail service determination will depend on the nature of the issue being investigated by NICTA.

2.3 The present inquiry

In 2011, bemobile Limited (bemobile) requested NICTA to hold a public inquiry to examine bemobile's claims that Digicel (PNG) Limited (Digicel) was pricing calls to bemobile customers in an anti-competitive manner. bemobile sought the establishment of a retail service determination and the imposition of retail price controls on Digicel.

NICTA staff undertook a preliminary examination of the substance of bemobile's complaint and concluded that there were matters that warranted being tested and considered further through a public inquiry process. In November 2011, NICTA staff issued a public discussion paper (referred to in this paper as the "first discussion paper") that set out in full NICTA staff's preliminary examination of what they considered to be the key relevant issues. The purpose of that first discussion paper was to generate discussion, information, comment and evidence from interested parties that would enable NICTA staff to determine whether or not there were grounds that warranted NICTA considering a specific proposal for a retail service determination.

Submissions in response to the first discussion paper were received from bemobile, Digicel and Telikom. Those submissions were made available on NICTA's Public Register to enable interested parties to comment on the arguments and evidence contained in those submission. Cross-submissions were received from bemobile and Digicel.

NICTA staff considered all of the issues raised in those submissions and concluded that some of the issues raised in the first discussion paper were not directly relevant to the matter under inquiry but that the substance of bemobile's original complaint warranted further detailed examination. To that end, NICTA issued a data request to bemobile, Digicel and Telikom and undertook further research into some of the issues raised by the submissions. The findings and proposed conclusions of NICTA staff's analysis and consideration of all the data and information that it has gathered and considered to date are set out in this second discussion paper.

NICTA staff's response to the issues raised in the submissions in response to the first discussion paper that are not otherwise addressed or reflected in this second discussion paper is set out in a separate Response to Consultation Report that is available from NICTA's Public Register. NICTA would encourage respondents to consider the material in that report in preparing their responses to this second discussion paper.

2.4 The inquiry process

The decision-making process that is being applied in the present inquiry is summarised in Figure 1. The first discussion paper was focused on the key threshold questions of:

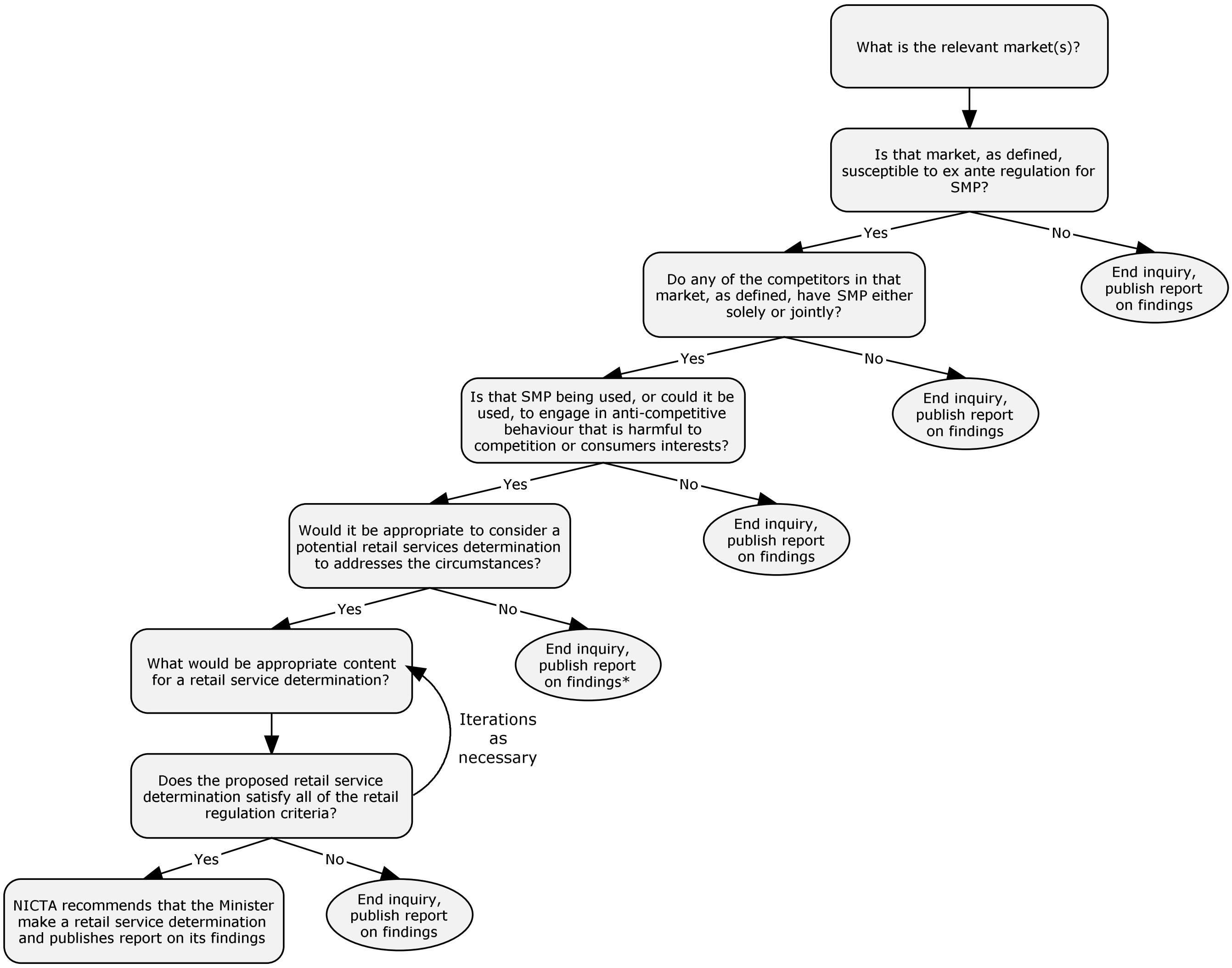
- what is the relevant market;
- is that market susceptible to ex ante regulation;
- if so does anyone have a substantial degree of power in that market (hereafter "SMP"); and
- if so, is there any harm to consumers or to effective competition being or able to be caused by that SMP.

The period under consideration is the forward-looking two year period to 30 June 2014. This period was considered appropriate because the ICT markets in PNG are developing rapidly, making it difficult to assess likely or potential developments beyond a two year time horizon.

NICTA staff were unable to reach conclusions on these threshold questions based on the responses to the first discussion paper, in part because NICTA staff initially defined the relevant market inappropriately, using a narrower service set than it now considers to be appropriate. NICTA staff sought additional information from relevant licensees through a data request and have revised the definition in this discussion paper.

As per Figure 1, NICTA staff intended to decide whether or not it would be appropriate in the circumstances to *consider* the making of a retail service determination and what form such a determination might take only if the key threshold questions were resolved in the affirmative and with specificity. If NICTA staff concluded that it would be appropriate to consider the making of a retail service determination, then a specific proposal for a determination would be developed and would be considered against the retail regulation criteria in the Act. NICTA staff indicated in the first discussion paper that that was the process being adopted.

Figure 1: The decision-making process being applied in the current inquiry[12]



* NB. If a problem was identified but it was not considered appropriate to address that problem through a retail service determination (which is the focus on the present inquiry) then subsequent consideration of other potential remedies to the problem might involve a separate inquiry.

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[12] The diagram has intentionally been kept simple and high-level in an effort to ensure it is not misunderstood. Hence the decisions are shown as being simple “yes” or “no” answers even though the answers are likely to be more complex and perhaps less straightforward in practice.

2.5 The structure of this discussion paper

The structure of this discussion paper follows the sequential process shown in Figure 1. There is a separate section summarising NICTA staff's analysis and consideration of each step/question.

2.6 Submissions in response to this discussion paper

NICTA invites written submission in response to the specific questions and issues raised in this discussion paper from any interested party. Arguments and assertions (as distinct from statements of opinion) should be supported with evidence and data, particularly if they are contrary to the current understanding or proposed conclusions of NICTA staff as set out in this discussion paper.

Submissions should be submitted via email to inquiry.submission@nicta.gov.pg and must be received **by 12 noon Friday 1st June 2012.**

Copies of all submissions received will be published on NICTA's Public Register consistent with the requirements on NICTA under subsection 229(3) of the Act.

2.7 Claims for confidentiality over information submitted to NICTA

Claims for confidentiality over any written information submitted to NICTA in response to this public consultation process are governed by section 44 of the Act. Under section 44 of the Act, NICTA ultimately determines whether or not it will accept a claim for confidentiality and exclude from publication the information that is subject to that claim. The process for claiming confidentiality is set out in the *Guidelines on the submission of written comments to public consultations and public inquires*, which are available from NICTA's Public Register. Any respondent that wishes to claim confidentiality over information that it submits in response to this discussion paper should follow the procedures described therein.

2.8 Tariff mediated network externalities

Tariff mediated network externalities and their potentially anti-competitive consequences have come under close examination in the present inquiry and are a topic mentioned and considered throughout this discussion paper. Accordingly, this section provides an overview of this particular type of network effect.

2.8.1 Network effects

In simple terms, network effects relate to the relative value of a network based on its size. The value of joining a particular telecommunications network for a new subscriber depends in part on the number of people who are already on the network. Similarly, the value of a network increases for all subscribers the more people who are connected to it. Subscribers therefore generate a private benefit (i.e. one that accrues to themselves) from being able to make and receive calls, and an *external* benefit that accrues to others from contacting and being contacted by them (or from being able to do so). However, when customers decide whether or not to subscribe to a mobile network, they generally take their own private benefit into account but not the external benefit. This difference is the source of a network externality.

Users of telecommunications networks want the potential to be able to call and to be called by as many other people as possible. In fact any constraint that limits this in practice, or makes it more difficult or dearer to achieve, is contrary to their preference. If there were multiple unconnected telephone networks, each with identical costs and quality, a new subscriber would generally prefer the one with the largest number of customers giving the larger network provider a competitive edge over smaller competing networks. In practice, a new subscriber might try to find out which network his friends, colleagues and other acquaintances have joined because they represent his immediate calling network of contacts.

For this reason, mandatory interconnection requirements are important to address the potential barriers to entry and expansion and resultant risks of market foreclosure that arise from direct network externalities. Any-to-any connectivity through mandatory interconnection requirements therefore acts to convert individual network amenity based on network externalities into a broader amenity available to all customers irrespective of the network they directly subscribe to. Hence any-to-any connectivity has been regarded as a consumer benefit (even entitlement) and one that regulators generally will uphold from the incursions of individual operators.

2.8.2 Tariff mediated network externalities

Although a subscriber to one network is able to call the subscribers of any other network, if on-net calls are cheaper than off-net calls a subscriber may prefer to subscribe to the same network as most of the people that he or she intends to call regularly. Laffont and Tirole (2001) describe this as a tariff mediated network externality, which effectively reintroduces the direct network externality that had been universalised by mandatory interconnection:[13]

> ‘Interconnection together with uniform (non-termination-based) pricing implies that consumers, when choosing a network, do not take into account the choice of network by the people they will want to call. In contrast, if on-net calls are cheaper than off-net calls, consumers are better off if the people they want to call select the same network.’[14]

[13] Laffont and Tirole (2001) *Competition in Telecommunications*, MIT Press, p.201

[14] Laffont and Tirole (2001) op.cit. p.201

This means that once one member of a tight calling group (or "calling club") is attracted to a particular network because of the on-net pricing, other members of that group may have a strong incentive to join that network as well. One by one, new and existing mobile phone users may conclude that enough of their contacts are on a particular network to make switching to that network worthwhile because it would mean more of their calls would be on-net and therefore less expensive. This is referred to as the 'club effect' and has been confirmed by empirical studies[15] by, among others, Kim and Kwon (2003),[16] Fu (2004),[17] Birke and Swann (2006)[18], Grzybowski and Pereira (2007),[19] Doganoglu and Grzybowski (2007),[20] Corrocher and Zirulia (2008),[21] Maicas, Polo and Sese (2009)[22] and recently also by the national competition authority in Portugal.[23]

2.8.3 The club effect

The club effect has two aspects. On the call origination side, subscribers prefer the larger network because they can expect, on average, to make cheaper calls (on-net). On the incoming calls side, insofar as they give attention to the matter, subscribers tend to prefer the larger network because they can expect, on average, to receive more calls (because there are more people on-net who can make cheaper on-net calls). This latter aspect reflects a call externality; that is, the benefit that is enjoyed by the receiver of a call that is made by another mobile subscriber. This club effect is recognised by the Body of European Regulators of Electronic Communications, which in 2007 stated:

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[15] NICTA staff also note that bemobile's response to the first discussion paper quoted from a 2010 study of the Paraguay telecommunications sector by Ovum, which bemobile says was commissioned by Paraguay's national regulatory authority, CONATEL, and which found that 42% of mobile subscribers in Paraguay described the club effect as the main basis for their choice of mobile network operator.

[16] Kim, H.-S., Kwon, N. (2003), 'The advantage of network size in acquiring new subscribers: a conditional logit analysis of the Korean mobile telephone market.' *Information Economics and Policy* 15, 17-33.

[17] Fu, W. (2004), 'Termination-Discriminatory Pricing, Subscriber Bandwagons, and Network Traffic Patterns: The Taiwanese Mobile Phone Market' *Telecommunication Policy* 28, 5-22.

[18] Birke, D. and Swann, P. (2006), 'Network effects and the choice of mobile phone operator', Journal of Evolutionary Economics, no. 16, pp 65-84.

[19] Grzybowski L. and Pereira, P. (2007) *Subscription choices and switching costs in mobile telephony*, available at https://editorialexpress.com/cgi-bin/conference/download.cgi?db_name=IIOC2008&paper_id=248

[20] Doganoglu, T. And Grzybowski, L. (2007) 'Estimating network effects in mobile telephony in Germany' *Information Economics and Policy*, no. 19(1) pp.65–79

[21] Corrocher, N. and Zirulia, L. (2008). *Me and You and Everyone We Know: An empirical analysis of local network effects in mobile communications*, Working Paper Series 03-08, Rimini Centre for Economic Analysis, available at www.rcfea.org/RePEc/pdf/wp03_08.pdf

[22] Maicas, J.P., Polo, Y. and Sese, F.J. (2009) 'The role of (personal) network effects and switching costs in determining mobile users' choice,' *Journal of Information Technology*, no.24 (2), pp.160–170, available at www.palgrave-journals.com/jit/journal/v24/n2/pdf/jit200835a.pdf

[23] *Autoridade da Concorrência* (2010) *Consumer mobility in the electronic communications sector*, available (in Portuguese) at www.concorrencia.pt/SiteCollectionDocuments/Estudos_e_Publicacoes/Comunicacoes_Electronicas/01_Relatorio_mobilidade_comunicacoes_electronicas.pdf Separate research in 2008 by the NRA in Portugal (ANACOM) found that 45% of survey respondents indicated that the main reason in their choice of MNO was based on the MNO that their network of family and friends were already subscribed to; see BEREC (2010) *BEREC report on best practices to facilitate consumer switching*, BoR (10) 34 Ref1, October 2010, p.60, available at http://erg.eu.int/doc/berec/bor_10_34_rev1.pdf

> 'Large operators can strengthen the related network effect they benefit from (and the attractiveness of their on-net offers) via two means:
>
> - The first one is related to originating calls: when a customer makes a call to someone that is [a] subscriber of the larger network (which happens with higher probability, depending on how that customer's calling circle is distributed across different networks), he will pay the on-net price if he is also [a] subscriber of that network, or will pay an off-net price if he is [a] subscriber of the smaller network. All else equal, his decision would then more often be to join the larger network, because the average or expected price is lower.
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> - The second one is related to the incoming calls, and exists because customers can be assumed to derive some utility from receiving calls. If a larger network charges a high off-net price, then customers are less willing to make calls to the other network than otherwise. Therefore, the value of a customer belonging to the smaller network is reduced, because he will be concerned that less people would call him.'[24]

Every subscriber that joins the larger network further increases the attractiveness of that network as it means there are more people to call at on-net rates, and an individual subscriber may receive more calls because the cost of those calls (to the on-net calling party) is cheaper. The club effect can thus lead to particular networks attracting many more subscribers much quicker than other networks. As additional subscribers increase scale advances, it may also enable the larger network operator to offer greater discounts for on-net calls, enabling it to reinforce or intensify the network effect. In situations where the club effect is able to play out without constraint, then, over time, a subscriber only has to subscribe to the largest network to call and be called at the cheapest rates.

2.8.4 Implications for competition

The club effect is magnified when there is a large difference between the off-net retail price and the on-net retail price and further magnified if the off-net retail price is inflated by an above-cost mobile termination rate (MTR). If the actual costs of termination are significantly lower than the prevailing MTR, then the larger network operator can price on-net calls close to, or even below, the MTR. The smaller network's off-net prices will need to be competitive with the larger network's on-net prices. However, the MTR effectively imposes a price floor under the off-net prices that can be economically offered by the smaller network. As a greater proportion of the smaller network's traffic is likely to be off-net (because there are more people to call on the larger network), the smaller network will have to pay the mobile termination charge for a larger proportion of

[24] BEREC (2007) *ERG's Common Position on symmetry of fixed call termination rates and symmetry of mobile call termination rates*, ERG (07) 83 final 090312, p.97, available at http://erg.eu.int/doc/publications/erg_07_83_mtr_ftr_cp_12_03_08.pdf. The club effect has also been recognised by other regulatory authorities including Ofcom in the UK, the European Commission, and the FCC in the USA.

traffic than the larger network. This creates potential for a margin squeeze on the smaller network.

This has been recognised in academic literature[25] and by regulatory authorities such as the European Commission, which has noted:

> 'It has been further indicated in recent economic literature that in the presence of call externalities mobile networks have strong incentives to implement on-net/off-net price differentials due to:
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> (i) high mobile-to-mobile termination charges which exceed marginal costs; and
>
> (ii) their strategic incentives to reduce the number of calls that subscribers on rival networks receive, reducing the attractiveness of rival networks and hence their ability to compete.
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> This theory suggests that mobile call termination charges above marginal costs can lead to permanent net payments by smaller networks and, since off-net prices are set above costs, also implies that smaller networks receive relatively fewer calls. According to some of [the academic literature], termination charges which are above the marginal costs of termination result in strategically-induced network effects which may be detrimental to smaller networks.'[26]

The use of on-net call pricing to generate strong club effects can have anti-competitive consequences, such as increasing barriers to entry and/or expansion and customer lock-in which, in turn, can lead to the foreclosure of the market to competition. The Body of European Regulators of Electronic Communications has noted that in certain circumstances an on-net/off-net retail price differential, combined with significantly above-cost mobile termination rates, can 'tone down competition to the benefit of larger networks'.[27] Further, those anti-competitive effects can be self-reinforcing. Birke and Swan (2009) have noted that:

> 'the high price of off-net calls cannot only be a *result* of market power, but can be a significant *source* of market power, which can especially be used to pre-empt entry by new competitors. If high switching costs are present in mobile telecommunications, this market power would be

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[25] Armstrong, M. and Wright, J. (2007), *Mobile Call Termination*, available at SSRN: http://ssrn.com/abstract=1014322; Hoernig, S. (2007) 'On-Net and Off-Net Pricing on Asymmetric Telecommunications Networks', *Information Economics and Policy* 19, 171-188; Calzada. J. and Valletti, T. (2008) 'Network Competition and Entry Deterrence,' *Economic Journal*, Royal Economic Society, vol. 118(531), pp.1223–1244; Harbord, D. and Pagnozzi, M. (2008), On-net/off-net price discrimination and 'bill-and-keep' vs. 'cost-based' regulation of mobile termination rates, available at http://ssrn.com/abstract=1374851

[26] European Commission (2009a), Explanatory note accompanying the EC Recommendation on the Regulatory Treatment of Fixed and Mobile Termination Rates in the EU - SEC(2009) 600, page 18 http://ec.europa.eu/information_society/policy/ecomm/doc/implementation_enforcement/eu_consultation_procedures/explanatory_note.pdf

[27] BEREC (2007), op.cit. p.97

> highly stable once consumers have aligned their operator choice even after the price differential between on- and off-net calls has been lowered.'[28]

However, it is also recognised that price discrimination between on-net and off-net calls may also occur for other reasons that would not necessarily give rise to competition concerns. As Cave, Stumpf and Valletti (2006) have noted:

> '...the underlying cost for on-net calls may differ from the cost for off-net calls. Clearly, the cost of these two types of calls differs if the (wholesale) cost of termination for off-net calls differs from on-net termination. Finally, if there is no exclusionary intent (that is, firms are more or less equally placed in the market and it is very unlikely that any firm will exit the market), on-net discounts may actually make mobile firms more rather than less aggressive overall. Precisely because customers would like to belong to the relatively bigger firm, firms are therefore rather aggressive when making their on-net pricing offers in the attempt to build market shares.'[29]

There is thus neither a prima facie case for or against on-net/off-net price discrimination as anti-competitive conduct and it must be examined on a case-by-case basis. Hence on-net/off-net price discrimination is commonly found in many mobile markets (in other countries) that are effectively competitive.

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[28] Birke, D. and Swann, G. (2007) 'Network effects and the choice of mobile phone operator', chapter in Cantnerm, U. and Malerba, F. (eds), *Innovation, industrial dynamics and structural transformation*, Springer, p.127

[29] Cave, M., Stumpf, U. And Valletti, T. (2006) *A review of certain markets included in the Commission's Recommendation on Relevant Markers subject to ex ante regulation*, p.85, available at http://ec.europa.eu/information_society/policy/ecomm/doc/library/ext_studies/review_experts/review_regulation.pdf

3 What is the relevant market?

3.1 Summary

NICTA staff have revised the proposed definition of the relevant market from that set out in the first discussion paper. NICTA staff now propose that the relevant market is the national retail mobile services market, which comprises mobile access and national mobile call origination, includes SMS and MMS, but excludes fixed telephony access and services and mobile data.

3.2 Introduction

There are three dimensions to the definition of a market for the purposes of a market analysis process. Markets need to be defined in terms of customers, geography and service.

3.3 Identifying the customer dimension

As this inquiry relates to Part VII of the Act, the customer dimension of the market must be defined as 'retail customers'. The Act defines a retail customer as:

> 'A person that is not a wholesale customer,[30] including an operator licensee in circumstances where that operator licensee acquires an ICT service for that operator licensee's own personal use rather than to facilitate the supply of an ICT service by that operator licensee.'

NICTA staff are using the concept of 'own use' or 'personal use' that is the essence of the definition of a retail customer in the Act for the purposes of this inquiry.

3.4 Identifying the geographic dimension

The geographic dimension of the relevant market is a national one because:

- there are no geographical differences in the retail pricing of mobile services, service options, or in the terms and conditions under which mobile services are supplied—that is the existing mobile network operators (MNOs) treat the market as national;
- licensees operate nationally with national brands, with intended "national" coverage and connectedness, and with common national back-of-house functions; and
- the dimensions of competition are national.

[30] A 'wholesale customer' is defined as an operator licensee, but excluding circumstances where that operator licensee acquires an ICT service for that operator licensee's own personal use rather than to facilitate the supply of an ICT service by that operator licensee.

As the network coverage areas of the three MNOs differ significantly, there are different supply circumstances in different parts of PNG in terms of service availability and the level of competition. This could possibly warrant a narrower definition of the geographic dimension of the market, or it may mean that there are multiple sub-markets that can be defined beneath the national market (for example, provincial markets). However, the current differences in service availability and the level of competition reflect a situation that is likely to be interim. One MNO has completed its mandatory coverage network rollout. The other two have obligations that have yet to be met. On that basis the national-nature of the market is more likely than not to be enhanced over time. On balance therefore NICTA staff are inclined to conclude that the relevant market is national in its scope.

NICTA staff note that in their submissions to the first discussion paper, both bemobile[31] and Digicel[32] proposed that the relevant market was national in scope.

3.5 Identifying the service dimension

Market boundaries are determined by identifying constraints on the price-setting behaviour of firms, which in turn means identifying the boundaries of substitutability in both demand and supply terms. There are two main competitive constraints to consider:

- how far it is possible for customers to substitute other services for those in question (demand-side substitution); and
- how far suppliers could switch or increase production to supply the relevant products or services (supply-side substitution);

following a price increase or a decrease in production by those currently serving the market.

As was pointed out by both bemobile and Digicel in their submissions to the first discussion paper, NICTA staff did not give due regard to supply-side substitution in their initial proposed definition of the relevant market.

The concept of the hypothetical monopolist test is often a useful tool to identify close demand-side and supply-side substitutes. A product is considered to constitute a separate market if a hypothetical monopolist supplier could impose a small but significant, non-transitory increase in price (SSNIP) above the competitive level without losing sales to such a degree as to make the SSNIP unprofitable. If such a price rise

[31] bemobile (2011a), *bemobile submission to NICTA on the need for a Retail Service Determination regarding Digicel's retail mobile pricing*, p.45

[32] Digicel (2011a), *Submission to NICTA: Public inquiry into the need for a Retail Service Determination (RSD) regarding certain mobile telephony services*, paragraph 64

would be unprofitable because consumers would switch to other products or because suppliers of other products would begin to compete with the monopolist, then the market definition should be expanded to include the substitute products.

However, in the present case, the hypothetical monopolist test does not appear to be particularly helpful in resolving the service boundaries that define the relevant retail market as NICTA staff do not have information on the elasticity of demand at current price levels. Further, NICTA staff do not have a basis for saying that the current price of calls and SMS are competitive—that is, that the prices are prices that would be set by a competitive market—and therefore has no means of avoiding the risks associated with the Cellophane Fallacy (explained in Annex A).

Question 1 (for MNOs only): What assumptions about price elasticity of demand do you make when determining or reviewing your retail prices for mobile services?

Question 2 (for MNOs only): What information do you have on price elasticities of demand for mobile services in PNG?

Question 3 (for MNOs only): Do you have any international benchmarks of retail mobile pricing or other information that indicates whether the current retail prices for mobile services in PNG are competitive (i.e. that they are prices that would be set by a competitive market)?

NICTA staff therefore considered that the key questions informing the definition of the service dimension of the market were as follows:

- Are mobile access and mobile call origination (i.e. outgoing calls) part of the same market?
- Are SMS (and MMS) services part of that same market?
- Are fixed services substitutes for mobile services to the extent that they are part of the same market?
- Are mobile data and mobile voice services part of the same market?

In considering these questions and the issues associated with substitutability without a current ability to apply the hypothetical monopolist test, NICTA staff have used the approach that market analysts adopted before that test was developed—namely, compare the characteristics of the services in question and consider the perceptions of consumers.

These questions are discussed in turn below.

3.5.1 Mobile access and mobile call origination

On the demand side, it would appear that mobile access and mobile call origination are not substitutes but are complements in that a customer cannot obtain mobile call origination (i.e. the ability to make outgoing calls) without first obtaining a mobile access service (e.g. in the form of an active SIM card). The access service provides the subscriber's specific mobile service with a network identity and enables it to be supported on the network. In addition to enabling the subscriber to make outgoing calls, the access service also enables incoming calls to be terminated.

On the supply side, all three MNOs currently offer both mobile access and mobile call origination. The three MNOs are thus already included in the market as suppliers of demand-side substitutes.

Accordingly, NICTA staff concluded that mobile access and mobile call origination are part of the same retail market.

3.5.2 The inclusion of SMS / MMS

On the demand side, text messaging could be a partial substitute for a call to another mobile phone. However, it would seem unable to be a complete substitute for a telephone call because the message length is limited to 160 characters and messages are exchanged on a store-and-forward basis and not in real time. The better approach would seem to be to regard SMS as a complementary service that provides the capacity to communicate when voice communication is possibly inadequate or inappropriate. Such situations might arise when SMS is used, for example, to support a call attempt with a SMS; to communicate when voice might disturb the called party; to confirm in text mode important information that may be lost in the course of a voice conversation; and to alert the called party to a future voice call or invite call-back.

On the supply side, the suppliers of SMS/MMS are the same service providers that supply the mobile access and mobile call origination services. SMS/MMS is not offered in PNG by entities other than the existing mobile network operators. Accordingly supply-side substitution is not a relevant factor.

It is reasonable to conclude that the two services should be taken together as constituting a cluster market, as they face similar competitive conditions (i.e. entry barriers, market shares, market structure etc.). The concept of complementary services is often related to cluster markets in any case. This is reinforced by the function of SMS/MMS as a part substitute for voice calls and the way SMS/MMS is often used when voice calls are not an option, as illustrated in the examples already given above. The complementary nature of the services in various situations suggests that complementarity and cluster market considerations offer the best way of perceiving the market and support the view that the services are part of the same market. Further, suppliers offer SMS/MMS and voice services together as a package (i.e. there are no “SMS only” mobile services available).

Accordingly, NICTA staff have concluded that SMS/MMS should be included in the same market as mobile access and mobile call origination.

3.5.3 The inclusion of fixed telephony services

Fixed-mobile substitution (FMS) is a well-established phenomenon that has become increasingly apparent in the past decade in all countries. It has two aspects—call FMS (i.e. the substitution of mobile call origination for fixed call origination) and service FMS (i.e. the displacement and substitution of mobile services for fixed services). These two aspects are best considered separately.

3.5.3.1 Call origination FMS

On the demand side, there is a clear possibility of substitution of fixed calls by mobile calls. They are both calls and users will readily make the other type of call if their first preference is not available. In most countries the growth in voice minutes is very much a case of growth in mobile voice minutes.[33]

On the supply side, there is scope for substitution between fixed and mobile call origination services. For example, a mobile operator could readily establish a fixed cellular service by limiting the mobility characteristic of the service and preventing call hand-over between cells. Alternatively, the service could be sold and priced as a fixed location call service without any guarantees on mobility. In Fiji, for example, the fixed operator, TFL, provides many new fixed services using cellular technology. A mobile network operator in PNG could readily do the same (NICTA staff note that Telikom offers fixed wireless services). However, although such possibilities can be envisaged, supply substitution in the opposite direction does not work as well. That is, fixed operators would not normally be in a position, given the technologies that they employ to provide fixed network service, to expand into mobile call service markets unless they were using cellular technologies to provide fixed service in the first place (as in the example of TFL in Fiji).

The growth of the calls in PNG in recent years has been about the growth in mobile calls. For example, total mobile minutes grew by 27% in 2011 over the previous year. Fixed calls have also grown but at a much slower rate and in response to the extension of wireless-based fixed services to areas previously not served by fixed infrastructure. The residual fixed call origination market is now much better defined in terms of businesses, government and some household use. This call market may be addressed quite separately from the mobile call market, although the rapid penetration of mobile services means that there is a constraint imposed on price and performance characteristics in the fixed call market.

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[33] International Telecommunication Union (2010) World Telecommunication/ICT Indicators Database, available at www.itu.int/ITU-D/ict/publications/world/world.html

3.5.3.2 Access service FMS

From a demand perspective, fixed and mobile access services may be separated and considered to be in different markets. Fixed services are by definition location-specific and tend to support the needs of communities or groups (such as families and offices). Unlike mobile services, fixed services do not tend to be regarded as personal communications services linked entirely to individuals. The mobility issue is also an important distinction that supports the personal communications nature of mobile services. The greatest level of service FMS tends to be where community and personal characteristics overlap, such as in the case of single-person households.[34] However this is a part-substitution; it does not apply in all situations.

In terms of supply-side substitution, fixed operators will struggle to provide any service that has the mobility characteristics of cellular mobile using traditional fixed network technologies. As already noted, mobile networks can be used for equivalents of fixed access but the cost characteristics will be different and price levels and structures might be different as a result

NICTA staff are of the view that fixed access services and mobile access services remain in different markets.

> **Question 4:** Are fixed voice call origination services and mobile voice call origination services in the same market? Is the situation the same for all call types (e.g. local/national calls, international calls, calls to mobile phones, calls to fixed phones)? Please provide argument and evidence to support your views.
>
> **Question 5:** Do you agree that fixed access services and mobile access services are in separate markets? Please provide argument and evidence to support your views.

3.5.4 The inclusion of mobile data (internet access) services

There are two key issues to consider in this respect:

(a) Whether mobile data is part of a separate market such as, for example, being in a separate data services market that may also include fixed data services); and

(b) Whether mobile data is in the same market as mobile voice.

These two issues are considered separately.

[34] See for example the experiences of Australia, Singapore and the United Kingdom.

3.5.4.1 Mobile data and fixed data services

High speed internet access is delivered over fixed networks and increasingly over fibre-based broadband networks. Many countries have established broadband service speed targets in the order of 50–100 Mbps. These speeds are not capable of being delivered on a guaranteed basis by mobile networks. Therefore, even though mobile and fixed networks deliver similar content and functionality at low speeds, mobile services are unable to support guaranteed high speed applications under full load conditions. Over time it is likely that the role of each service will become better defined, albeit with some overlaps. The development of applications (data services) iPhones, iPads etc represent a separate further development of over the top (OTT) services which are independent of the mobile network operator. The complimentarity of fixed and mobile data services is reinforced by the fact that many people subscribe to both and use them for different purposes.

Therefore from both demand and supply-side perspectives, mobile data services and fixed data services would seem to be in separate markets. This separateness would seem likely to become further exacerbated as fixed high speed internet access capacity increases over time.

3.5.4.2 Mobile data and mobile voice

A separate market appears to be developing for mobile data – with operators retailing data access and service separately from mobile call access and origination services. The increasing promotion and availability of dongles or mobile modems that can be purchased with separate mobile data access is early evidence of this. Mobile voice is not a substitute for mobile data, but the two services can be sold as a package or as a cluster in much the same way as mobile voice and SMS. The difference between SMS and mobile data in this respect is that SMS is a part substitute for voice in certain situations, and SMS is not retailed as a stand-alone service offering.

NICTA has not arrived at any conclusion on this issue, and is seeking further information from respondents to assist in the analysis.

> **Question 6:** Are mobile data services and mobile voice (i.e. mobile access and mobile call origination) services is the same market or in separate markets? Please provide argument and evidence to support your views.

3.6 Proposed conclusion

NICTA staff believe that the relevant retail market is the retail mobile services market, which comprises mobile access and mobile call origination, includes SMS and MMS services, but excludes fixed telephony access and mobile data. NICTA requires further information to form a final view as to whether fixed voice call origination is in the same market as mobile call origination but will assume for the purposes of the rest of this discussion paper that *they are not*. NICTA also requires further information to form a final view as to whether mobile data services are in the same market as mobile (voice) call origination but will assume for the purposes of the rest of this discussion paper that *they are not*. These assumptions have no better basis than that they are convenient and reflect the more conservative view of market boundaries that were applied by many telecommunications regulators in the mid-2000s. NICTA remains genuinely open-minded on the two issues and invites respondents to comment in detail on this particular aspect and provide supporting evidence for their views.

NICTA staff note that in their submissions in response to the first discussion paper, both bemobile and Digicel proposed similar definitions of the relevant market to the definition now being proposed in this paper.[35]

3.7 International precedents

NICTA staff note that the proposed definition of the retail mobile services market is consistent with the conclusions of many other national regulatory authorities. In is submission in response to the first discussion paper, Digicel provides nine such examples.[36]

Specific questions for stakeholders

Question 7: Do you agree with NICTA staff's proposed conclusion that the relevant market is the national market for retail mobile services with both the inclusions and exclusions as set out in this paper? Provide evidence and data to support your answer.

[35] bemobile submitted that the relevant market was 'the national market for the supply of domestic on-net and off-net mobile voice and SMS services'. bemobile (2011a) op.cit. p.2. Digicel submitted that the relevant market was the market for 'the provision of mobile telecommunications retail services to end users in Papua New Guinea'. Digicel (2011a) op.cit. paragraph 64. However, Digicel also stated that the definition of the market should include international call origination; Digicel (2012), *Submission to NICTA: Public inquiry into the need for a retail services determination (RSD) regarding certain mobile telephony services*, 9th March 2012, paragraph 77.

[36] Digicel (2011a), op.cit., paragraphs 70–71

4 Is the market susceptible to ex ante regulation?

4.1 Summary

NICTA staff have considered whether the retail mobile services market, as defined, fulfils the three criteria that determine whether a market is susceptible to (though not necessarily in need of) ex ante regulation to address the risks of harm potentially associated with substantial market power (SMP). NICTA staff have concluded that the retail mobile services market satisfies all three criteria.

4.2 The three criteria test

Whether or not ex ante regulation of dominance may be warranted in a particular market is typically determined by applying the so-called 'three criteria test' of the susceptibility of a market to ex ante intervention. The application of this test has been documented by the European Commission[37] and by the Body of European Regulators for Electronic Communications (BEREC).[38] The test has since been adopted widely and is applied in many countries outside of Europe, such as Moldova, Oman, Saudi Arabia and the United Arab Emirates. Under this approach a particular market will be considered susceptible to ex ante regulation if:

(1) it has high and continuing barriers to entry;
(2) it is not tending towards a sustainable competitive market; and
(3) ex post regulatory controls are unlikely to be sufficient to address concerns associated with market dominance.

A market that satisfies all three criteria is susceptible to ex ante regulation. That is, the application of ex ante regulation may be warranted. However, even if a particular market fulfils all three criteria it does not automatically mean that ex ante regulation is necessary in that market. NICTA may still forbear from regulation to monitor the way the market develops, particularly if there are other constraints that might discourage or prevent the exercise of any substantial market power (SMP) or dominance.

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[37] European Commission (2007), *Recommendation on relevant product and service markets within the electronic communications sector susceptible to ex ante regulation in accordance with Directive 2002/21/EC of the European Parliament and of the Council on a common regulatory framework for electronic communications and service*, OJ L344/25 of 28 December 2007. http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2007:344:0065:01:EN:HTML See also the *Explanatory Note - Accompanying document to the Commission Recommendation on relevant product and service markets within the electronic communications sector susceptible to ex ante regulation in accordance with Directive 2002/21/EC of the European Parliament and of the Council on a common regulatory framework for electronic communications and services*, SEC (2007) 1483 final.

[38] European Regulators Group (2008), *Report on guidance on the application of the three criteria test*, Available at www.erg.eu.int/doc/publications/erg_08_21_erg_rep_3crit_test_final_080604.pdf

4.2.1 Criterion 1: Does the market have high and continuing barriers to entry

Of particular relevance are indicators of barriers to entry in the absence of regulation, including the extent of sunk costs, market structure, market performance and market dynamics, and involving indicators such as market shares and trends, market prices and trends, and the extent and coverage of competing networks or infrastructure.[39]

There are various types of barriers to entry:

- Absolute barriers exist where firms own, have access to, or are granted privileged use of important assets or resources which are not similarly accessible to potential entrants;[40]
- Structural barriers to entry result from original cost or demand conditions that create asymmetric conditions between incumbents and new entrants impeding or preventing market entry of the latter. For instance, high structural barriers may be found to exist when the market is characterised by absolute cost advantages, substantial economies of scale and/or economies of scope, capacity constraints and high sunk costs. [41] (Sunk costs are costs which are needed to enter an industry but which cannot be recovered on exit. Existing firms, which only have to cover ongoing costs, could set prices too low to allow entrants both to recover sunk costs and compete.)
- Legal or regulatory barriers are not based on economic conditions, but result from legislative, administrative or other state measures that have a direct effect on the conditions of entry and/or the positioning of operators on the relevant market;[42]
- Strategic barriers arise due to the strategic behaviour of existing market players, for example through pricing behaviour (such as price discrimination) or through non-price behaviour (such as increased investment, promotion and distribution).[43]

Mobile telecommunications markets generally are characterised by two significant structural barriers to entry:

- large sunk costs of network construction, which increase barriers to entry and exit and give significant competitive advantages to ‘first movers’; and

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[39] Ibid

[40] Body of European Regulators for Electronic Communications (BEREC) (2005) *Revised ERG Working Paper on the SMP concept for the new regulatory framework*, ERG (03) 09rev3, September 2005, p. 8, available at www.erg.eu.int/doc/publications/public_hearing_concept_smp/erg_03_09rev3_smp_common_concept.pdf

[41] European Commission (2007), op.cit., recital 9-10,

[42] Ibid

[43] BEREC (2005), op.cit. p.8

- significant economies of scale, scope and density, which put newer 'smaller' entrants at a competitive disadvantage to the larger incumbent(s) or first-movers who have a lower per-unit cost base.

These structural barriers apply notwithstanding that mobile networks are scalable to some extent.

In PNG these structural barriers to entry may be being exacerbated by the strategic barriers being created by tariff mediated network externalities (as explained in section 2.8 on page 8) that are being examined in the present inquiry and the risk of customer 'lock-in' that they foster.

There are also legal and regulatory barriers to entry to the market, most notably in the form of operating licences and spectrum licences. However, the operating licence requirement is a low barrier as there are no legal limits on the number of operating licences that NICTA may grant in response to qualified applications and the licence eligibility criteria are not onerous.

NICTA staff consider that the retail mobile services market satisfies this first criterion.

4.2.2 Criterion 2: Is the market tending towards being sustainably competitive?

Although the barriers to entry are high and continuing they are not insurmountable. Of greater importance for present purposes is the fact that there are three licensed MNOs who have entered the market. The question then is whether the market is tending towards a sustainably competitive state in the two year time horizon of this analysis.

Digicel commented in its submission to the first discussion paper, with specific reference to economies of scale, that '[c]ompetition between operators gives all operators an opportunity to achieve the minimum efficient scale, so no single operator has an inherent cost advantage over the other operators.'[44] Leaving aside for the moment the issue of what might be a minimum efficient scale in the case of the PNG mobile market, NICTA staff agree that there is an opportunity for all operators—in theory. However, the circumstances of competition, absent regulation, are critical in determining whether the market might develop in the manner suggested.

NICTA staff considered whether there was any evidence that indicated that this might be the case in the retail mobile services market and looked for evidence that the market was either sustainably competitive or trending towards being sustainably competitive. However, NICTA staff found that the evidence available was actually indicative of a market that was neither effectively competitive now nor moving towards becoming effectively competitive in the time horizon under analysis. In particular:

[44] Digicel (2011a), op. cit., paragraph 90(d)

- Digicel's high market shares in terms of both subscribers (75%)[45] and revenues (88%)[46] have remained very high despite competitive responses by bemobile and the entry of Telikom (see Figure 2 on page 30);
- If there was effective competition, one would expect that competition from bemobile and the entry of Telikom, together with the achievement of scale economies, would be evident in price changes over the course of recent years as margins are eroded and/or cost savings are passed on to consumers. However, the average revenue per voice minute carried for the market as a whole has effectively remained unchanged during that time (being 32 toea in 2010 and 31 toea in 2011);
- Digicel controls the only mobile network with near-national coverage (24% of total land area and 72% of population). bemobile's network currently covers 4% of national land area and 23% of population. Telikom's network area and population coverage are also much smaller than Digicel's. Within the next two years, bemobile will extend its network pursuant to a licence condition (expected to achieve 6% of land area and 36% of population by 30 December 2012). Expansion beyond the licence obligation will depend on capital constraints and the residual commercial opportunity in the uncovered areas. Telikom is also expanding its network but is also capital constrained and will likely have coverage that remains less than Digicel's for the period within the time horizon of this document. Accordingly, Digicel's network coverage will be partially duplicated by bemobile within the next two years, but it is unlikely to be fully matched;
- There are barriers to either bemobile or Telikom expanding in this market because they would both need to undertake substantial network investment to expand their network coverage and, thus, service offering. In addition, there is likely to be a first mover advantage in many localities in PNG in securing subscriptions from early adopters and before saturation is reached in the segments who can afford the service,[47] although the strength of the first mover advantage is difficult to assess. NICTA staff are also concerned that tariff-mediated network externalities may be generating a strong club effect that is fostering customer lock-in, making it more difficult for competitors to induce existing subscribers to switch their supplier. This reinforces the first mover advantage;

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[45] Based on 2011 data.

[46] Based on 2011 data.

[47] Cabral L.M.B. (1990), 'On the adoption of innovations with 'network' externalities', *Mathematical Social Sciences* 19, p.299–308; Cabral, L., Salant, D. and Woroch, G. (1999) 'Monopoly pricing with network externalities' *International Journal of Industrial Organization 17*(2) p.199–214; Bijwaard, G. Janssen, M. and Maasland, E (2008) 'Early mover advantages: an empirical analysis of European mobile phone markets' *Telecommunications Policy* 32(3/4), p.246–261, available at http://homepage.univie.ac.at/maarten.janssen/industrial%20organization/Early%20mover%20advantages.pdf; Grajek, M. (2010) 'Estimating network effects and compatibility: evidence from the Polish mobile market' *Information Economics and Policy* 22, p.130–143; Eggers, P., Grajek, M. and Kretschmer, T (2011) 'Decomposing first mover advantages in the mobile telecommunications industry' ESMT Research Working Papers ESMT-11-03 (R1), ESMT European School of Management and Technology, available at www.esmt.org/fm/479/ESMT-11-03_R1.pdf

- NICTA staff could not identify any potential competitors, that is, prospective new entrants that are not already active in the market (bemobile and Telikom are already active in the market), whose existence and potential entry would act as a constraint on the behaviour of licensees already in the market.

These factors were analysed and considered in much greater detail than reflected here. As many of these same factors were considered as part of the analysis of the effectiveness of competition, to minimise repetition in this discussion paper the detailed discussion of those factors is set out in section 5.

It is important to note when considering the prospect for sustainable competition that the nature of current and continuing dominance is considered. SMP is concerned with position in the market—however achieved—and it is therefore irrelevant to point out, as occurred in response to the first discussion paper, that smaller operators have the same opportunity and licence authorisation to invest and to grow their networks as larger operators. The theoretical opportunity to compete is not the same as a tendency towards competition.

NICTA staff believe that the retail mobile services market satisfies this second criterion.

4.2.3 Criterion 3: Are ex post regulatory controls unlikely to be sufficient to address concerns associated with market dominance

The decision to identify a market as susceptible to ex ante regulation should also depend on an assessment of the sufficiency of competition law to address any market failures that may result from the first two criteria being met. NICTA staff considered that the competition concerns in the retail mobile services market are such that they would not be sufficiently addressed by ex post regulation. NICTA staff concluded that relying entirely on ex post regulation would not be sufficient or appropriate for the following reasons:

- With liberalisation of the ICT sector still very recent, NICTA wishes to ensure that the newly liberalised markets develop in a way that ensures they are effectively competitive in the long-term and ex ante regulatory measures are better able to prevent anti-competitive practices and to mitigate the harm from SMP in the market than ex post regulatory measures, which are geared towards identifying and penalising anti-competitive behaviour after the fact;
- NICTA staff are concerned about the possible use of (or the existence of incentives to use) tariff-mediated network externalities to increase barriers to entry and expansion and thereby limit the ability of competitors to compete in the market. If such conduct exists or occurs and was effective, it would be very difficult to reverse the anti-competitive consequences of that behaviour through ex post regulatory intervention;
- As some form of regulatory intervention in relation to the supply of retail services and/or setting of retail prices may be necessary, ex ante regulation would be more flexible and responsive than ex post regulation and would better accommodate the

need for timely adjustment or removal of such regulations as circumstances change;

- NICTA staff noted the common view of the national regulatory authorities in the European Union that ex post regulation can prove to be insufficient in the assessment of excessive pricing scenarios because of the difficulties in the detection and proof of such conduct.[48] Hence preventative regulation in the form of ex ante intervention is preferable where such scenarios may exist.

Accordingly, NICTA staff concluded that the retail mobile services market satisfies this third criterion.

4.3 Proposed conclusion

NICTA staff believe the retail mobile services market satisfies the three criteria that need to be cumulatively satisfied to determine that a market is susceptible to (though not necessarily in need of) ex ante competition regulation.

4.4 International precedents

NICTA staff recognise that the national regulatory authorities of many countries—particularly in developed countries in the European Union—have tended to forebear from ex ante regulatory intervention in retail mobile services markets. Instead, where competition concerns are identified in retail markets, those regulators prefer to intervene in the relevant upstream wholesale market. However, NICTA staff also note that the proposed conclusion that the retail mobile services market is susceptible to ex ante regulation has many precedents. For example, the retail mobile markets were determined to be susceptible to ex ante regulation by the Telecommunications Regulatory Authority (TRA) in the United Arab Emirates (UAE) in 2011,[49] by the Communications Commission of Kenya (CCK) in 2010,[50] and by ictQATAR in Qatar[51] in 2008.

In addition, if a relevant wholesale market does not exist—and this is effectively the case at present in PNG—then it is futile to pretend that the wholesale market is the

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[48] European Regulators Group (2008), op,cit, p.14

[49] Telecommunications Regulatory Authority of UAE (TRA) (2011a) *Determination no. (1) of 2011: relevant markets for telecommunication services and related products in the UAE*, available at www.tra.gov.ae/download.php?filename=policies_regulations/Determination%20No%20(1)%20of%202011%20market%20final.pdf

[50] Communications Commission of Kenya (CCK) (2010a) *Determination on interconnections rates for fixed and mobile telecommunications networks, infrastructure sharing and co-location, and broadband interconnection services in Kenya*, available at www.cck.go.ke/regulations/downloads/interconnection_determination_no2_2010.pdf

[51] ictQatar (2008) *Notice and orders of the Supreme Council of Information and Communications Technology (ictQATAR) setting forth the methodology and standards for determining market power and initial designation of Qatar Telecom (Qtel) QSC as a dominant service provider in specified relevant markets for the period 2007 to 2010*, available at www.ictqatar.qa/sites/default/files/documents/MDDD_NoticeOrders.pdf

place to start. Wholesale markets do not emerge overnight, and if they rely on regulatory intervention for their existence, they may take some time to become established. In the meantime, if there is a threat from SMP to competition values in the relevant retail market, regulators have the practical choice of intervening in the retail market or not intervening effectively at all in the short to medium term.

Specific questions for stakeholders

Question 8: Do you agree with NICTA staff's proposed conclusion that the retail mobile services market is susceptible to en ante competition regulation? Provide evidence and data to support your answer.

5 Does any licensee have a substantial degree of market power?

5.1 Summary

NICTA staff have analysed a range of factors relevant to determining whether there is any participant with a substantial degree of power in the retail mobile services market and concluded that they provide a clear and compelling indication that Digicel does have such a position. Consequently, the market cannot be considered to be effectively competitive. Further, in the absence of ex ante regulation, NICTA staff believe that Digicel's SMP would be likely to endure over the forthcoming two years and likely for longer than that.

5.2 Introduction

Substantial degree of power in the defined market (hereafter "SMP") is not defined in the Act. NICTA staff are therefore obliged to consider the usual meaning of the term in relevant literature, including the literature on market dominance, and equivalent term or near equivalent term in other jurisdictions such as in Europe. The Body of European Regulators for Electronic Communications has observed:

> 'The determination that a company has a dominant market position requires a wider assessment of all the competitive conditions of significance for the market in question. If this assessment reveals an imbalance in the relevant characteristics to one company's advantage, this could mean that the company's scope for using competitive parameters or market strategies can no longer be adequately constrained by its competitors.' [52]

NICTA's staff analysis of the factors that are determinative of SMP focused on Digicel because:

(a) it was the subject of bemobile's original complaint and

(b) if any competitor in the market is going to have SMP it would be Digicel, given its market share,[53] established network and extensive customer base.

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[52] BEREC (2005) op.cit. p. 8.

[53] In September 2008, the CEO of Digicel Pacific publicly claimed that Digicel had a market share of approximately 65% in PNG. Tabureguci, D., 'Telecommunications: Our customers are our focus, says Digicel Pacific', in *Islands Business*, available at www.islandsbusiness.com/islands_business/index_dynamic/containerNameToReplace=MiddleMiddle/focusModuleID=18200/overideSkinName=issueArticle-full.tpl

The factors that are relevant to SMP are considered in a forward looking analysis of the market over the two year period ending 30 June 2014. The ICT markets in PNG are developing rapidly and as a result NICTA staff believe that attempting to assess developments beyond a two year horizon may prove to be quite difficult and even unreliable.

5.3 Market share

Market shares are not conclusive of SMP on their own. In the application of competition law in the European Union, operators with a market share of less than 25% are unlikely to have SMP, while a market share greater than 50% tends to lead to a rebuttable presumption of SMP. In the European Commission's decision-making practice, SMP concerns normally arise where an operator has at least 40% market share. However, there may even be concerns about dominance where an operator has less than 40%, depending on the size of that operator's market share relative to its competitors.[54]

Market shares may be assessed either on the basis of subscribers, sales volume or value of sales. Usually share of revenue (value of sales) is preferred because subscribers are not of equal value or equal potential and most markets are multi-product with value being the only common measure that can be applied. Comparison of market shares measured by subscribers, sales volume and sales value often provides useful analytical insights. In the case of a fairly homogenous product or service, an operator that has a higher market share by value than by volume might be an indication that that operator can price above rivals and make super normal profits, which might be a sign of SMP.[55]

The market shares of the three MNOs in terms of subscribers, revenues and voice minutes, and the recent changes in those shares, are shown in Figures 2 and 3.

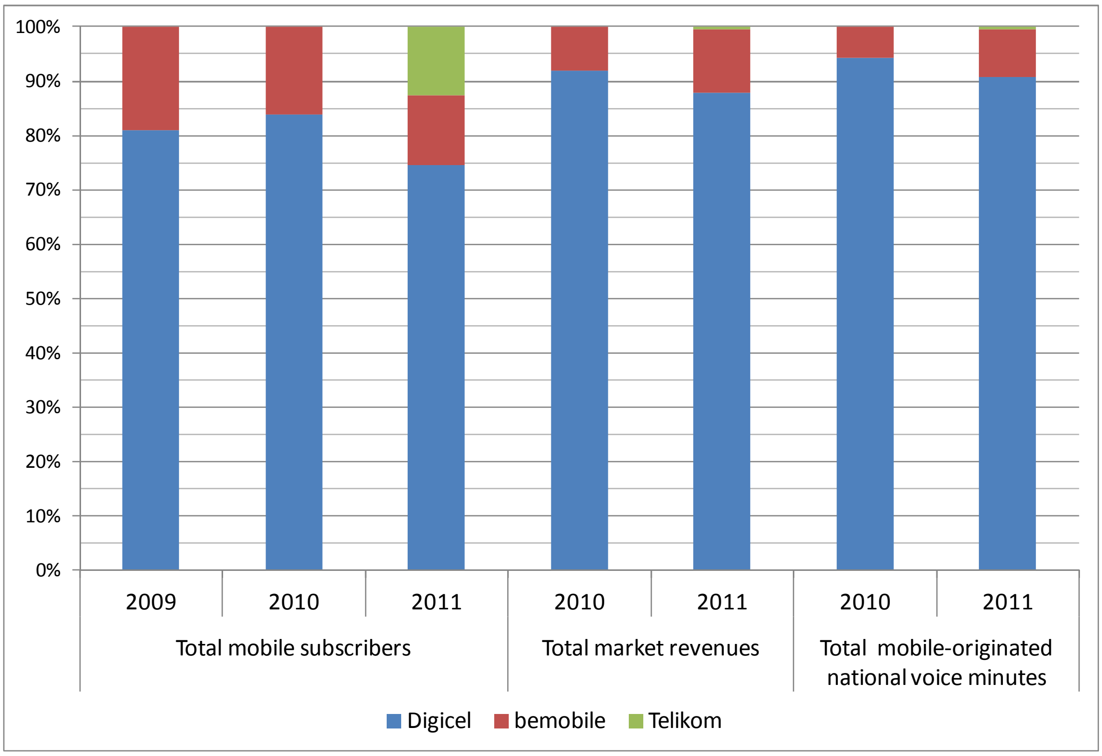
Figure 2: Market share data for the retail mobile services market

MNO	**Total subscribers**			**Total market revenues**		**Total mobile-originated national voice minutes**	
	2009	**2010**	**2011**	**2010**	**2011**	**2010**	**2011**
Digicel	81.0%	83.7%	74.6%	91.9%	87.9%	94.2%	90.6%
bemobile	19.0%	16.3%	12.8%	8.1%	11.5%	5.8%	8.8%
Telikom	0.0%	0.0%	12.6%	0.0%	0.6%	0.0%	0.6%
	100.0%	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**

[54] BEREC (2005) op.cit. p. 4. It is important to note that in the EU, and also in other quite diverse jurisdictions such as Samoa, Malaysia and Saudi Arabia, the 40% rule is only a rebuttable assumption that encourages the circumstances of market share and concentration to be further analysed. In those jurisdictions, a burden is placed on operators with above-threshold level market shares to argue why they should not be regarded as having SMP.

[55] BEREC (2005), op.cit. p.4–5

Figure 3: Market shares for the retail mobile services market



It is likely that a proportion of subscribers will have a mobile access subscription (i.e. SIM) with more than one network in order to take advantage of the cheaper pricing of on-net calls. (Pre-paid price trends are summarised in Annex B.) However, the evidence for this is anecdotal.[56] Given Telikom's promotion of dual-SIM handsets, and its achievement within a period of 12 month of almost the same number of subscribers as bemobile, it appears as though a high proportion of Telikom's subscribers—possibly in the order of 60%[57]—may be pre-existing subscribers of another MNO. If that is the case, the subscriber market share data, and in particular the recent change in shares evident in 2011, is likely double counting many customers and presenting a distorted picture of the market. Accordingly, NICTA staff believe that the revenue and traffic data shown in Figures 2 and 3 provide a more accurate picture of market shares.

Digicel's high market shares have been sustained over at least the last two years. This is reflected in the high market concentration, as demonstrated by the high Herfindahl Hirschman Index[58] (HHI) of 5,888 based on subscribers,[59] 7,859 based on revenues,[60]

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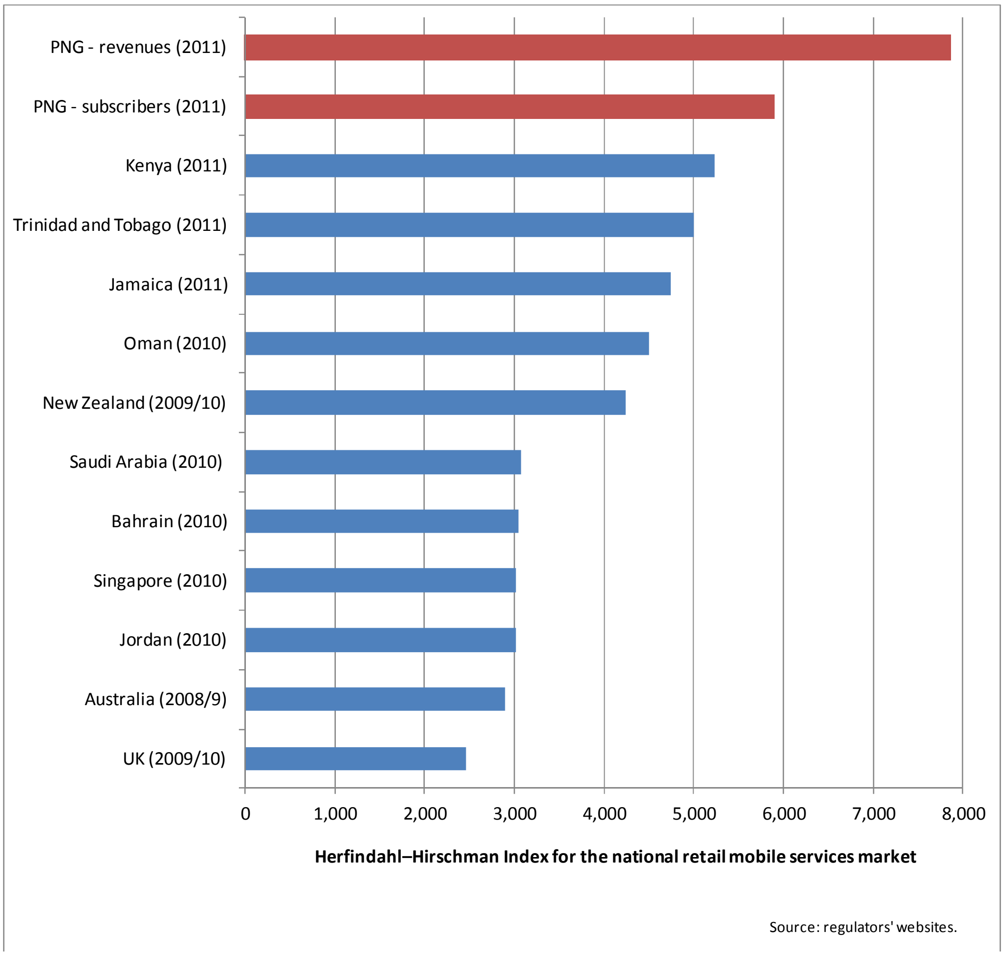
[56] NICTA staff note Digicel's comment (at paragraph 79 in Digicel (2012) op.cit.) that '...Digicel's customer activity data indicates that most of Digicel's customers regularly use two or more different mobile services' but have not seen that data or received any evidence to support that comment.

[57] Based on NICTA staff's analysis of changes in subscriber numbers over the last six months in 2011 using data that was provided in-confidence to NICTA by each of the three MNOs.

[58] The value of the index is calculated from the sum of the squares of the market shares of all firms in a market, expressed as HHI = $s1^2 + s2^2 + s3^2 + ... + sn^2$ (where s1 and s2 are market shares and sn is the market share of the n^{th}

and 8,239 based on mobile-originated national voice traffic.[61] By way of comparison, a less concentrated three-competitor mobile market with a 40%, 35% and 25% market share profile would have a HHI measure of 3,450.[62] So the market concentration is clearly very high in PNG. This is further demonstrated by Figure 4 which compares PNG's HHI with that of retail mobile markets in a number of other countries (for which HHI data was available). PNG's high market concentration coupled with the very large disparity between the market shares of Digicel and the other MNOs suggests that Digicel has a position of SMP that is very substantial.

Figure 4: International comparison of Herfindahl-Hirschman Index in retail mobile markets



firm). The HHI takes into account the relative size and distribution of the firms in a market and approaches zero when a market consists of a large number of firms of relatively equal size. In a monopoly the HHI is 10,000—the maximum index figure. The HHI increases both as the number of firms in the market decreases and as the disparity between the market shares of those firms increases.

[59] Based on 2011 data

[60] Based on 2011 data

[61] Based on 2011 data

[62] The HHI measure of 1,800 that is commonly interpreted as an indication of a highly concentrated oligopoly market structure relates to manufacturing industries and is thus not an appropriate benchmark for mobile telecommunications markets.

5.4 Control of infrastructure not easily duplicated

This "control of infrastructure" indicator refers to a situation in which the availability of a certain infrastructure is necessary to produce a particular product or service; the required infrastructure is exclusively or overwhelmingly under control of a particular operator; and there are high and non-transitory barriers to duplicating or substituting for the infrastructure in question. In such a situation, the control of infrastructure not easily duplicated can make it feasible for the operator in question to behave independently from other suppliers (i.e. MNOs) and to exercise market power (in absence of significant countervailing power), as there is almost no actual or potential competition. One example is control/ownership of a large network that a competitor would find costly and time-consuming to build in order to provide the service in question. Such control may hence represent a significant barrier to entry. In addition it might be possible for the supplier to lever its market power horizontally (to adjacent markets) or vertically (to downstream markets).[63]

Digicel's network coverage area is currently significantly larger than bemobile's (refer Figure 5). (In November 2009, Digicel had 'over 500 towers across PNG' which it claimed provided 'up to three times more coverage than bemobile'.[64] Today Digicel has 700 sites.[65]) Although it is possible for either bemobile or Telikom (or a new entrant) to duplicate Digicel's coverage, there are a number of factors that make it very difficult to do so. Those challenges include PNG's terrain; land ownership and access issues; a lack of infrastructure (such as grid power and access roads) and the consequential complication of logistics (for example, to keep up supplies of diesel fuel to on-site diesel generators); and the absence of a wholesale market for facilities sharing.[66] Such challenges can be overcome. However, it can be more difficult commercially for second and subsequent entrants to do so when there is a first mover in place that has already secured the early adopting consumers (who tend to be the more profitable per person[67]) and that is not obliged to provide, and demonstrates no interest in providing, any form of facilities or site sharing.

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[63] BEREC (2005), op.cit. p.5

[64] Digicel (2009) *Digicel responds—What war on mobile?* (media release), 2nd November 2009, available at www.digicelpng.com/en/about/news/digicel-responds-what-war-on-mobile

[65] Digicel (2012), op,cit. paragraph 71

[66] Many of these challenges have been noted by Digicel. See Digicel (2011b) *Dealing with operational challenges,* Presentation by Mr John Mangoes, CEO of Digicel PNG, at the Papua New Guinea Advantage Conference on 5th August 2011, available at www.businessadvantageinternational.com/John_Mangos_Digicel.pdf

[67] Cabral L.M.B. (1990) op.cit.; Cabral, L., Salant, D. and Woroch, G. (1999), op.cit.; Bijwaard, G. Janssen, M. and Maasland, E (2008) op.cit.; Grajek, M. (2010) op.cit.; Eggers, P., Grajek, M. and Kretschmer, T (2011) op.cit.

Figure 5: Comparison of MNO's (2G) network coverage

	Network coverage as a proportion of the total area of PNG		**Network coverage as a proportion of the total inhabited areas of PNG**		**Percentage of population in network coverage area**	
	As at Dec 2011	**Estimated as at Dec 2012**	**As at Dec 2011**	**Estimated as at Dec 2012**	**As at Dec 2011**	**Estimated as at Dec 2012**
Digicel	23.8%	24.4%	81%	83%	72%	74%
bemobile	4.4%	5.8%	15%	20%	23%	36%
Telikom	5.9%	not available	20%	not available	18%	22%

As Digicel noted in its submission to the first discussion paper, such a first mover advantage can be eroded away.[68] However, in this case, that appears unlikely to happen within the forthcoming two years under consideration. bemobile is currently in the process of expanding its network coverage area. It has recently secured a direct term loan from the Asian Development Bank (ADB) to fund part of the construction of up to 300 base transceiver stations (BTS) and backbone infrastructure and network upgrading across twenty provinces.[69]

The timeframe for this network expansion aligns with bemobile's network coverage obligations under the terms of its Network Licence, which require bemobile to provide network coverage in:

- at least 56 administrative district centres by 31 December 2012; and
- at least 69 additional localities by 30 June 2013.

Once that is complete, Digicel will still have network infrastructure in up to 31 administrative district centres and up to 51 additional localities that is unlikely to have been duplicated. (Telikom has identical network coverage obligations to bemobile, but on a later timescale that is beyond the period under consideration.)

Any control that Digicel currently has over infrastructure that is not easily duplicated will thus be diminished over time—except possibly in relation to the 31+51 areas (referred to above) served by Digicel that are not intended to be covered by bemobile's network expansion plans.

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[68] Digicel (2011a) op.cit. paragraph 90(b). Digicel disputed that any such first mover advantage existed in PNG and, in any case, considered that any such advantage would be eroded 'quickly'.

[69] bemobile (2011b) *Proposed equity investment and loan: bemobile expansion project (Papua New Guinea and Solomon Islands)—Environment Assessment Report*; March 2011, p.1, published by the Asian Development Bank, available at www.adb.org/Documents/IEES/REG/44937/44937-01-reg-iee.pdf

5.5 Network effects

Network effects describe the dependence of consumer willingness to pay for a given good on the number of users of that good (i.e. on the size of the network). A good or service exhibits network effects when the utility of a user increases with the number of other users consuming that good.[70] The presence of network effects can therefore confer market power on firms with high market shares.[71]

Network effects are a common feature and can be a powerful influence in mobile telecommunications markets.[72] This has been shown in many empirical studies in many different countries.[73] With network effects, the value of joining a particular mobile network for a new subscriber depends in part on the number of people who are already part of that network. Similarly the value of the mobile network increases for all subscribers the more people who are connected to it. This can be a source of enduring competitive advantage for larger MNOs and create the risk of markets "tipping" in their favour, particularly when there are factors that deter switching between service providers.[74]

For reasons explained in section 2.8, and based on the empirical studies of mobile subscribers' reasons for choosing and remaining with particular networks in the face of on-net/off-net price discrimination,[75] NICTA staff believe that the scale of Digicel's price discrimination between on-net and off-net calls is fostering tariff mediated network effects (and a club effect) that enables it to attract many more subscribers much quicker than other MNOs, and which also deters churn away from Digicel. The strength of this particular network effect in PNG is currently unknown as NICTA has no empirical information specific to mobile subscribers in PNG with which to measure it, however, the disparity in network size and the extent of the price discrimination between on-net and off-net calls indicates that it is very large indeed.

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[70] Farrell, J. And Klemperer, P. (2007) 'Coordination and lock-in: competition with switching costs and network effects', in Armstrong, M. And Porter, R. (eds), *Handbook of Industrial Organization*, vol.3, Elsevier

[71] Klemperer, P. (1987) 'Markets with consumer switching costs', *The Quarterly Journal of Economics*, no.102(2), pp.375–394; Klemperer, P. (1995) 'Competition when consumers have switching costs: an overview with applications to industrial organisation, macroeconomics and international trade', *Review of Economic Studies*, no.29(1), pp.38–56; Farrell, J. and Klemperer, P. (2007) op.cit.

[72] Srinivasan, R., Lilien, G.L. and Rangaswamy, A. (2004) 'First in, first out? The effects of network externalities in new product growth', *Journal of Marketing*, no.71, July 2004, pp.52–74

[73] Such as Kim, H.-S., Kwon, N. (2003); Fu, W. (2004); Birke, D. and Swann, P. (2006); Grzybowski L. and Pereira, P. (2007); Doganoglu, T. And Grzybowski, L. (2007); Corrocher and Zirulia (2008); and Maicas, Polo and Sese (2009).

[74] Birke and Swan (2009) op.cit.

[75] Such as Kim, H.-S., Kwon, N. (2003); Fu, W. (2004); Birke, D. and Swann, P. (2006); Grzybowski L. and Pereira, P. (2007); Doganoglu, T. And Grzybowski, L. (2007); Corrocher and Zirulia (2008); and Maicas, Polo and Sese (2009).

5.6 Barriers to expansion

There may be more active competition where there are lower barriers to growth and expansion. While growth and expansion is easier to achieve (particularly for new entrants) in growing markets, it might be inhibited in mature, saturated markets, where customers are already locked in with a certain supplier and have to be induced to switch.[76]

The retail mobile services market is not yet mature and is still growing. The annual growth was 25% in 2010 and 29% in 2011, corresponding to penetration levels of 31% and 40% respectively. There is thus still considerable room for expansion—that is, there is a considerable number of potential mobile phone users who could be attracted into the market. However, NICTA staff note that the higher spending and thus more profitable customer segments are likely to have already been attracted into the market and become mobile phone subscribers. This means that the potential yield from first-time mobile subscribers yet to be attracted into the market is likely to be lower than that from the existing base of mobile subscribers.[77] This may constitute an economic barrier to expansion, particularly given Digicel's superior and sustained installed base of customers, as set out in Figure 6.

Figure 6: Retail mobile services market shares by subscribers and revenues

MNO	Total subscribers			Total market revenues	
	2009	2010	2011	2010	2011
Digicel	81.0%	83.7%	74.6%	91.9%	87.9%
bemobile	19.0%	16.3%	12.8%	8.1%	11.5%
Telikom	0.0%	0.0%	12.6%	0.0%	0.6%
	100.0%	**100.0%**	**100.0%**	**100.0%**	**100.0%**

Figure 6 shows that, in 2011, Digicel had a revenue share of 88% compared to a subscriber share of 75%. Although not conclusive, it suggests that on average Digicel's customers are worth more and that its installed base is superior to that of the other MNOs. It would also seem to support bemobile's comment in its submission that '...bemobile is more active in the consumer market segment than in the provision of services to business customers and as a result would be expected to have a higher share of low ARPU (Average Revenue Per User) customers.'[78]

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[76] BEREC (2005), op.cit. p.7

[77] Cabral L. (1990), op.cit.; Cabral, L., Salant, D. and Woroch, G. (1999) op.cit.; Bijwaard, G. Janssen, M. and Maasland, E (2008) op.cit.; Eggers, P., Grajek, M. and Kretschmer, T (2011) op.cit.

[78] Lanigan. E. (2011), op.cit. p.7

As discussed in section 5.4, both bemobile and Telikom are endeavouring to expand. In doing so they face no regulatory barriers (in terms of licensing requirements or inadequate access to spectrum) but do face some legal and technical barriers (such as land ownership and access issues and a lack of infrastructure), although the scale of those barriers may differ depending on the circumstances of the particular MNO. As is also noted in section 5.4, those barriers are not insurmountable and might be overcome in time, but they will not be overcome completely during the two year period under consideration.

The barriers to expansion faced by bemobile and Telikom in areas where they already have network coverage are significantly lower as substantial capital investment is not required to be able to provide service. However, in those areas, the tariff mediated network effects generated by the scale of Digicel's on-net/off-net price discrimination is likely to constitute a strategic barrier. That such on-net/off-net price discrimination serves as a strategic barrier to expansion (or entry) is widely accepted in the economic literature[79] and is also supported by empirical studies (of mobile subscribers in other countries).[80] In its submission to the first discussion paper, Digicel commented that '...with network effects there will be a stronger incentive [for all competitors] to compete for customers and increase the size of [their respective] network[s]'.[81] NICTA staff agree with that proposition but consider that Digicel's first mover initiative has enabled it to establish a much larger network of subscribers than bemobile and Telikom combined so that Digicel can leverage this larger customer base to generate further and greater network effects through its on-net/off-net price discrimination.

5.7 Ease of market entry

The threat of potential entry may prevent firms from raising prices above competitive levels, leading thereby to a situation in which no market power is exercised. However, if there are significant barriers to entry, this threat may be weak or absent. Operators may then be able to raise prices and make persistent excess profits without attracting additional competition that would reduce them again. The impact of entry barriers is likely to be greater where the market is growing slowly and is initially dominated by one large supplier, as entrants will be able to grow only by attracting customers from the dominant firm. However, barriers to entry may become less relevant where markets are associated with ongoing technological change and innovation.[82]

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[79] See for example Hoernig, S. (2007); Calzada, J. & Valletti, T. (2008); Stennek, J. and Tangerss, T. (2008), *Intense Network Competition*, NET Institute Working Paper #08-36; Lopez, A. & Rey, P. (2009), *Foreclosing Competition Through Access Charges and Price Discrimination*, IDEI Working Paper No. 570; Cabral, L. (2011), 'Dynamic price competition with network effects', *Review of Economic Studies*, 78, 83–111, available at http://luiscabral.org/economics/publications/RES%202011.pdf; and Harbord, D. & Pagnozzi, M. (2010).

[80] Such as Kim, H.-S., Kwon, N. (2003); Fu, W. (2004); Birke, D. and Swann, P. (2006); Grzybowski L. and Pereira, P. (2007); Doganoglu, T. And Grzybowski, L. (2007); Corrocher and Zirulia (2008); and Maicas, Polo and Sese (2009).

[81] Digicel (2011a), op.cit. paragraph 90(c)

[82] BERC (2005), op.cit. p.8

NICTA staff did not identify any absolute barriers to entry (notwithstanding the conclusions regarding control of infrastructure not easily duplicated in section 5.4). However, NICTA staff concluded that there were considerable strategic barriers to entry in the form of the tariff mediated network effects generated by the scale of Digicel's on-net/off-net price discrimination, as discussed in section 5.6.

As discussed in section 4.2.1, the construction of a mobile telecommunications network also involves substantial sunk costs, particularly in the absence of any commercial or regulated facilities sharing. Those costs generally relate to the installation of a network of masts and antennae with supporting power and road access; a backhaul and transmission network along with switches and routers; and extensive computer hardware and software to support billing, customer service and operational systems. Although some of these costs are scalable (as noted by Digicel in its submission to the first discussion paper[83]), much of these costs will still need to be sunk before commercial launch is feasible and unlikely to be recovered on exit. The size of those sunk costs constitutes a significant barrier to entry and introduces an asymmetry between existing MNOs and any new entrants as the new entrants must recover their sunk costs in additional to avoidable fixed and variable costs while the existing MNOs need only to recover the avoidable costs to remain in the market. In this context, NICTA staff regard Telikom as still being in the process of entering the retail mobile services market.

There are also legal and regulatory barriers to entry to the market, most notably in the form of operating licences and spectrum licences. However, the operating licence requirement is a low barrier as there are no legal limits on the number of operating licences that NICTA may grant in response to qualified applications and the licence eligibility criteria are not onerous.

5.8 Absence of potential competition

This refers to the prospect of new competitors that are in the position to switch or extend their line of production entering the market (e.g. due to a hypothetical price increase) within the timeframe considered by the market review. The record of past entry is one factor that can be looked at, as well as potential barriers to entry.

In the first discussion paper, NICTA staff suggested that this particular factor may not be relevant to the current assessment of competition because NICTA staff could not identify any potential competitors. Telikom is already active in the market and thus represents actual competition, not potential competition.[84] Telikom's existence and its effects are thus taken into account under the heading of barriers to expansion (in

[83] Digicel (2011a) op.cit. paragraph 90(d)

[84] This fact was incorrectly described in the first discussion paper, in which NICTA staff categorised Telikom as potential competition instead of actual competition.

section 5.6). NICTA staff now recognise that this was not explained clearly in the first discussion paper.

In its submission to the first discussion paper, Digicel stated that to disregard potential competition was 'manifestly erroneous' because '[p]otential competition is an important factor that can constrain the market power of existing competitors...'.[85] NICTA staff agree that potential competition can be an important constraint on any SMP. However, after further review and consideration, NICTA staff have been unable to identify any potential competitors that might enter the retail mobile services market within the next two years. Also, none were identified by respondents to the first discussion paper. Further, NICTA staff have concluded that the prevailing conditions of the market are unlikely to provide either an incentive or an opportunity for any such entry within the next two years.

As noted in sections 4.2.1 and 5.7, the large sunk costs of network construction and the economies of scale inherent in mobile telecommunications networks represent significant structural barriers to entry. There is no wholesale market for the supply of the associated network services that would presently provide a means for a new entrant to avoid those particular barriers through resale or some form of MVNO arrangements and there is no evidence to indicate that such wholesale services would be made available voluntarily by any of the existing mobile network operators within the next two years. Although it is not impossible for a new entrant with its own infrastructure to overcome those structural barriers over time, there are additional factors that are, or may be, exacerbating the impact of those barriers, such as the tariff mediated network externalities that are being examined in the present inquiry and the risk of customer 'lock-in' that they foster. There is also a significant regulatory barrier in the form of spectrum access.

With Digicel already operating nationally, bemobile in the process of significantly expanding its coverage, and Telikom having recently launched its mobile service, there is unlikely to be any major incentive for any potential competitor to enter the market with its own network within the next two years and compete against established brands.

5.9 Absence of or low countervailing buying power

The existence of customers with a strong negotiating position, which is exercised to produce a significant impact on competition, will tend to restrict the ability of providers to act independently of their customers. Such power is more likely where a customer accounts for a large proportion of the producer's total output, is well informed about alternative sources of supply, is able to switch to other suppliers readily at little cost to itself, and where it may even be able to begin producing the relevant product itself.

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[85] Digicel (2011a) op.cit. paragraph 94(i)

This criterion is generally more meaningful in wholesale markets because suppliers that are purchases of wholesale services are typically more visible and powerful than retail customers.[86]

If countervailing buying power exists in the retail mobile market, it is most likely to exist only in relation to business customers as they are the only type of user than can account for a large proportion of an MNO's total traffic or revenue.[87] This point was noted by bemobile in its submission[88] and recognised by Digicel in its cross-submission.[89] It is generally difficult for pre-paid subscribers to bring countervailing buying power to bear, because they may not be visible to the supplier. The customers that are clearly visible to the supplier are the post-paid customers and they may well represent a higher proportion of business customers than the overall subscriber base. However, the post-paid segment represents only a very small share of the market (3% in revenue terms and 1% in subscriber terms) so any countervailing buying power would only be a possible constraint for a very small part of the total market. It would be unlikely to constrain Digicel in following a pricing strategy in the market as a whole.

NICTA staff concluded that there is no countervailing buying power in the retail mobile services market sufficient to constrain any SMP.

5.10 Switching barriers

When considering a switch to new services in place of existing services, there are three possible cases. First, consumers will remain with current services if satisfied. Second, if not satisfied after a comparison of information, they will substitute the services in question for new services unless significant barriers exist (such as uncertainty about the quality of service and reputation of alternative suppliers). If consumers already have a considerable investment in equipment necessary for the services, are locked into long-term contracts or are concerned about disruptions and inconveniences in so doing, they will stick to current services and show inertia in the choice of services and operators. Consumers' reluctance to switch suppliers can subsequently work as a potential barrier to entry and/or expansion.[90]

It is virtually impossible to measure switching costs directly as they are in large part consumer-specific, reflecting the level of effort required by an individual and thus

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[86] BEREC (2005), op.cit. p.5–6

[87] Australian Competition and Consumer Commission (2004) *Competition in the corporation customer segment of telecommunications markets: July–December 2003*, available at www.accc.gov.au/content/item.phtml?itemId=609651&nodeId=0d605051c352e83d1cefeb1f2a568c87&fn=Competition%20in%20telco%20markets%20June%202004.pdf

[88] Lanigan, E. (2011), op.cit. p.11

[89] Digicel (2012), op.cit. paragraph 105

[90] BEREC (2005), op.cit. p.8

unable to be calculated from any data.[91] One of the proxies for measuring switching costs in other economies is the percentage of actual switching to new service providers after receiving relevant information. If the level of consumer satisfaction drops over time but the rate of switching service providers stays relatively low, this implies a high level of switching barriers exists in the relevant market.[92] However, NICTA does not have any data on either the level of switching or levels of consumer satisfaction. Both of these types of data would need to come from consumer surveys because the high level of pre-paid subscriptions obscures the view of individual behaviour that might otherwise be based on cancellations.

NICTA staff identified and considered the following indirect switching costs in the retail mobile services market:

- The lack of mobile number portability
- Minimum contractual terms
- SIM-locked handsets
- Search costs
- Tariff mediated network externalities

(i) The lack of mobile number portability

Without mobile number portability, mobile subscribers are unable to retain their mobile number if they switch service provider. In its submission to the first discussion paper, Digicel said it was 'manifestly erroneous' that the absence of MNP represented a switching cost as 'there is no evidence that in Papua New Guinea, end users are strongly committed to a given mobile number [and] Digicel's experience is to the contrary as end users readily change their mobile numbers'.[93] (Digicel did not provide any supporting evidence on this point.)

NICTA staff believe that the absence of MNP does constitute a switching barrier, but that the significance of that barrier as a deterrent to switching is likely to differ greatly between different customer segments. For example, the need to obtain a new telephone number might be a greater switching deterrent for business customers compared to residential customers given that the former may have to incur the costs associated with changing stationary and advertising material and risk a loss of business due to missed calls from customers unaware of the number change. Anecdotal evidence also suggests that many mobile subscribers in PNG maintain mobile services with more than one MNO (for example, to take advantage of the pricing of on-net calls on multiple mobile networks). Such a trend may imply that price sensitive customers may indeed have little attachment to a particular mobile number.

[91] Shy, O. (2002), 'A quick and easy method for estimating switching costs', *International Journal of Industrial Organization*, no.20, p.71-87

[92] Ibid

[93] Digicel (2011a), op.cit. paragraph 90(f)

However, the evidence from other countries (albeit those with developed economies) indicates that the absence of MNP is indeed a barrier to switching.[94]

(ii) Minimum contractual terms

The minimum contractual term for Digicel's post-paid service is 12 months.[95] This is not excessive by international standards and in any case, applies only to the 1% of its customers that are not prepaid. Therefore, this factor cannot have significance for the market overall.

(iii) SIM-locking

SIM-locking is the practice whereby handsets are programmed to use only the SIM card that the phone was sold with and consequently do not work with any other SIM card from any other service provider. All handsets sold by Digicel (in association with both prepaid and post-paid services) are SIM-locked to Digicel's network.[96]

In its submission to the first discussion paper, bemobile identified SIM-locking as a relevant switching barrier as it 'effectively means that in order to switch network a customer needs to purchase a new phone, thereby increasing the cost of switching considerably'.[97] NICTA staff agree that SIM-locking constitutes a barrier to switching. NICTA staff note that the stated purpose of SIM-locking is to ensure that the cost of subsidising handsets can be recovered through call revenue earned over a reasonable period. Without handset subsidies, mobile services would be considerably less affordable for many consumers. However, the purpose is less relevant to whether Digicel has a position of SMP. By retaining customers, SIM-locking is contributing to the barriers to switching.

(iv) Search costs

There are a number of factors that a mobile subscriber is likely to research and consider when deciding whether or not to change service providers. Such factors are

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[94] See for example Gryzbowski, L. (2005) 'Regulation of Mobile Telephony across the European Union: An empirical analysis', *Journal of Regulatory Economics* 28(1) pp.47–67; Lee, J., Kim, Y., Lee, J.D. and Park, Y. (2006) 'Estimating the Extent of Potential Competition in the Korean Mobile Telecommunications Market: Switching costs and number portability', *International Journal of Industrial Organization* 24(1) pp.107–124; and Buehler, S., Dewenter, R. and Haucap, J. (2006) 'Mobile Number Portability in Europe', *Telecommunications Policy* 30(7): 385–399.

[95] Clause 3 of Digicel's standard terms and conditions for post-paid services, available at www.digicelpng.com/plans/digiselect/select_terms

[96] Digicel's standard terms and conditions for prepaid services state 'All Handsets sold through our authorised dealer channel are locked to the Network. You are not permitted to remove, or have a third party remove, the lock without authorisation in writing from us. Full details of the authorisation format and unlocking process are available from our Customer Care Centre.' Digicel's standard terms and conditions for post-paid services state 'All Handsets sold through our authorised dealer channel are locked to the Network. Customers are not permitted to remove, or have a third party remove the lock, without authorization in writing from us.' Terms and conditions are available at www.digicelpng.com/en/plans/digiflex/flex_terms and www.digicelpng.com/en/plans/digiselect/select_terms, respectively.

[97] Lanigan, E. (2011) op.cit. p.11

likely to include whether the other network has coverage where the customer wants to use his or her mobile; the tariffs that apply to the types of calls that the customer expects to make at the time of day the customer expects to make them; the kind of services the customer wants to use as part of their mobile service (e.g. voicemail, m-banking); and whether the customer's preferred handset is available. The time spent researching and considering these factors constitutes a search cost. However, this is unlikely to represent a significant barrier to switching because the service options and alternatives are quite straightforward (each MNO offers both a prepaid and a post-paid service, each with certain features and tariffs), which simplifies the process of comparison between suppliers. Further, relevant information is easy to obtain via retail outlets, customer care telephone services and the MNOs' websites.

(v) On-net/off-net price discrimination

Significant price discrimination between on-net and off-net calls can constitute an obstacle to the switching of a given individual when the people which that customer calls most often (e.g. his or her family and friends) are subscribers of the same existing service provider.[98] This is the club effect described in section 2.8 and arises because leaving the larger network implies losing the benefits derived from making cheaper calls to the members of that same network.[99] This has been recognised as a barrier to switching between MNOs by the Body of European Regulators for Electronic Communications, with on-net/off-net price discrimination being identified as 'a major obstacle in respect of switching mobile telephone services' by the national regulatory authorities (NRAs) in Norway, Portugal, Slovenia and Switzerland, and as a 'relevant concern' (in the context of switching) by the NRAs in Belgium, Bulgaria, Czech Republic, Ireland, Malta, Romania and Sweden.[100] It is also reflected in the empirical studies by Birke and Swann (2006)101 and Grzybowki and Pereira (2007)[102] and recently by the national competition authority in Portugal.[103]

5.11 Economies of scale

Economies of scale arise when increasing production causes average costs (per unit of output) to fall. Economies of scale are common where the production process involves high fixed costs. One other way in which increasing scale can lower unit costs is by

[98] Maicas, J. and Sese, F. (2008) *Análisis de la Intensidad de los Costes de Cambio en la Industria de la Telefonía Móvil* [Analysis of the intensity of switching costs in the mobile phone industry], *Cuadernos de Economía y Dirección de la Empresa*, April 2008, no.35, pp.27–56, available (in Spanish) at. http://redalyc.uaemex.mx/pdf/807/80703502.pdf

[99] Maicas, J. and Sese, F. (2011) 'Network Effects in the Mobile Communications Industry: An Overview', in Maícas, J. (Ed.), *Recent Developments in Mobile Communications — A Multidisciplinary Approach*, InTech.

[100] BEREC (2010) *op.cit.* p.59

[101] Birke, D. and Swann, P. (2006), op,cit,.

[102] Grzybowki L. and Pereira, P. (2007) op.cit.

[103] *Autoridade da Concorrência* (2010) op.cit.

allowing greater specialisation, and in turn higher productivity. Economies of scale on their own do not create entry barriers—given a certain level of demand, technology and cost function, competitors can exhaust the same economies if they are able to produce the same volumes. However, economies of scale can de-facto amount to an entry barrier if further factors—such as sunk costs and switching costs—exist so that economies of scale create an asymmetry between one operator and its competitors. If this is the case, economies of scale can act as a barrier to entry as well as an advantage over existing competitors.[104]

Mobile networks are scalable, and even small networks can achieve returns to scale for part of their investment by rolling out progressively and giving priority to high demand areas. In fact, most mobile operators do precisely this and achieve early returns to scale in the process. That mobile networks are scalable was a point noted by both bemobile[105] and Digicel.[106]

However, scalability is more relevant and evident in relation to those parts of a network where cost is coverage-driven rather than capacity-driven. This point was noted by bemobile. This means that low-market-share operators have relatively large proportions of coverage driven cells with relatively very low volumes of traffic which, in turn, translates into high cost per minute of service. If the barrier to entry arises through the existence of a scale economy, the extent of this scale economy can be measured (e.g., in the form of a cost volume elasticity).

Digicel submitted in response to the first discussion paper that 'previous official decisions [by the Independent Consumer and Competition Commission]' show that 'there is no basis for assuming that the minimum efficient scale for mobile services is so large as to prevent bemobile or Telikom from achieving the requisite scale. The cost of network equipment is not high and available from international vendors at competitive prices'.[107]

Even allowing for Digicel's point that scale economies may be evidenced at relatively low market shares, there is still a question about when scale economies might be expected to become pronounced and when they might cease (that is, when are scale economies exhausted). The European Commission in its 2009 recommendation on mobile termination rates stated:

[104] BEREC (2005), op.cit. P.6

[105] Lanigan (2011) op.cit. p.9

[106] Digicel (2011a) op.cit. paragraph 90(d)

[107] Digicel (2011a) op.cit. paragraph 90(e)

> '…in the mobile market it can be expected to take three to four years after entry to reach a market share of between 15 and 20%, thereby approaching the level of the minimum efficient scale.' [108]

On this view, supported by the experience of the collective member states of the European Union, a share of 15 to 20% only *approaches* minimum efficient scale. In PNG neither bemobile nor Telikom have that market share at this stage (refer Figure 2 on page 30). In addition, Digicel's market share is such that it might suggest that it has fully benefited from most available scale economies.

It is not relevant for present purposes whether, as Digicel has suggested, the failure of bemobile and Telikom to achieve a viable market share for minimum efficient scale is a result of their own poor commercial management choices or not. The key fact is that the situation in relation to scale effects exists and results in the position that Digicel has in the market.

5.12 Excess pricing and profitability

The ability to price at a level that keeps profits persistently and significantly above the competitive level is an important factor for SMP. In a competitive market, individual firms are typically not able to maintain prices above economic costs and sustain excess profits for any appreciable time. As costs fall, prices may be expected to fall too, if competition is effective. Although the existence of prices at a level that keeps profits persistently and significantly above the competitive level is an important indicator for the existence of SMP it is not a necessary condition for finding SMP.[109]

Excessive prices can be detected by an analysis of Price Cost Margins (PCM) which measure directly the deviation of prices from costs. However, although valuable from a theoretic perspective, in many cases necessary data to calculate PCM are not available at a disaggregated product or market level. In addition, the fact that in communication markets usually there are multi-product undertakings with high joint and common costs that have to be attributed to certain services may make the calculation of PCM even more difficult.[110]

An international benchmark (adjusted to reflect purchasing power parity) of how much a 'typical prepaid user'[111] pays for a common basket of calls and SMS in suggests that Digicel's pre-paid prices in PNG are among the highest in the region (refer Figure 7).[112]

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[108] European Commission (2009b) *Commission Recommendation of 7 May 2009 on the Regulatory Treatment of Fixed and Mobile Termination Rates in the EU* (2009/396/EC), paragraph 17, available at http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:124:0067:0074:EN:PDF

[109] BEREC (2005) op.cit. p.8

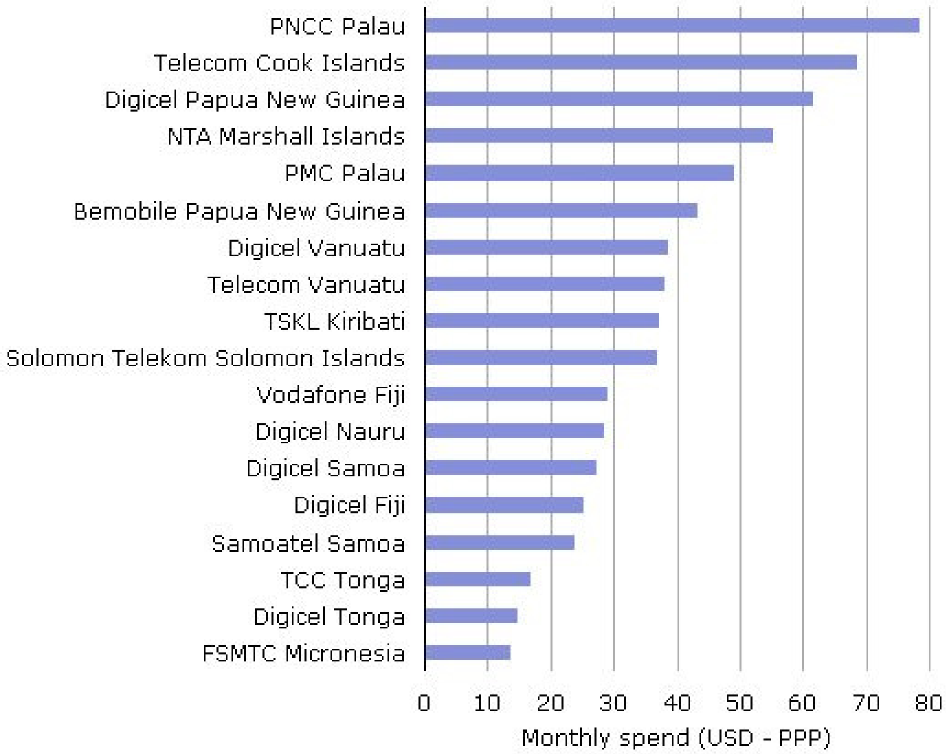
[110] Ibid

[111] Defined as someone on a prepaid plan who makes 40 calls and sends 60 text messages per month.

[112] Although this international benchmark is prepared annually, 2011 was the first time that a 'typical prepaid user' basket has been included so it is not possible to compare the results with previous exercises.

The benchmark suggests that for a common basket of calls and SMS services, Digicel in PNG is the third most expensive among the 12 Pacific island nations included in the benchmark. The first and second most expensive service providers are PNCC in Palau and Telecom Cook Islands, both of which are statutory monopolies serving much smaller populations than in PNG. bemobile ranks sixth.

Figure 7: International comparison of the monthly spend on mobile services for a "typical prepaid subscriber"[113]



NICTA staff recognise that international benchmarks of prices can sometimes be problematic as the complex differences in the circumstances of various countries must either be normalised or disregarded, which can introduce a degree of subjectivity into the process.[114] Consequently NICTA staff have not given undue weight to the benchmark or relied upon it. NICTA staff have simply noted that this particular benchmark indicates that (pre-paid) retail prices in the retail mobile services market could be considered high relative to other Pacific island nations which are unlikely to have lower unit costs.

[113] Source: Network Strategies (2011) *2011 Pacific Island mobile market update*, available at www.strategies.nzl.com/wpapers/2011012.htm#ex1

[114] For example, in the present benchmark different national currencies and purchasing powers have been normalised through the conversion of prices in local currencies into prices in US dollars using purchasing power conversion factors. Differences in the geographical size and populations of different countries have presumably been disregarded (because they could not be normalised).

5.13 Lack of active competition on non-price factors

There are other strategic competition parameters besides pricing. For example, such non-price factors may include marketing, service quality, service range, innovation, or geographic coverage.

There is evidence of increasing competition on some of these factors in PNG. For example, bemobile's network expansion plans are partly intended to 'improve service reliability', expand coverage, and 'enable the supply of data services'.[115] Also, Digicel's promotional material often emphasises its differences in network coverage, customer care and the availability of state of the art handsets (such as Blackberry) or technologies (such as 3G). However, the market is also very price sensitive and consequently, it is likely that the non-price aspects of competition tend to be dominated by price considerations. This is evident in the high level of price related promotions (both standing and temporary) that emphasise low tariffs or free credits. Some examples are shown in Figure 8.

Figure 8: Overview of recent price-related promotions

bemobile	Digicel
Turbo—Get 5 times more value just by dialling *1290*1*turbo	Digicel offers K45 free credit with all new handset and SIM purchases till end of June 2011
K50 top-up—Top-up with K50 and you get unlimited bemobile to bemobile calls and texts for 30 days	100% bonus credit for online top-up
Huawei phone promotion—Purchase a Huawei G6603, G6620 or U3100 and get K100 pre-loaded credits free	

5.14 Additional factors analysed by NICTA staff but found not to be relevant to the determination of SMP in this market

5.14.1 Overall size of the licensee

This refers to the potential advantages, and the sustainability of those advantages, that may arise from the large size of one operator relative to its competitors. Areas where such advantages may exist include economies of scale, finance, purchasing, production capacities, and distribution and marketing. Such advantages may accrue in part due to other activities of the licensee beyond the relevant market.[116]

[115] bemobile (2011b) op.cit. NICTA staff also note bemobile's statement that '...customers typically value having access to national coverage even if they make little use of it...' Lanigan (2011), op.cit. p.2

[116] BEREC (2005), op.cit. p.5

NICTA staff did not consider this factor to be a relevant in this case because there is no evidence that Digicel (PNG) has advantages relative to bemobile and Telikom from its size or the overall size of the group that it is part of. Some advantage from overall scale of purchasing from international vendors may be imagined, but there is no evidence available.

5.14.2 Easy or privileged access to capital markets/financial resources

Easy or privileged access to capital markets may represent a barrier to entry as well as an advantage over existing competitors. Aside from internal sources (e.g. as indicated by cash flow or revenue) the ability to procure outside capital, a firm's capital structure, and its ability to increase equity capital (e.g. structure of shareholders) or debt might be considered. Further, access to capital might be influenced if a firm has links with other companies (e.g. affiliated companies belonging to the same group) that are favourable for its activities in the market in question.[117]

In October 2009, the Asia Development Bank noted with respect to PNG that:

> 'The local debt market is limited at present, particularly for medium-term financing. Offshore commercial and export credit sources are also limited in extending uncovered financing to businesses in PNG. The global financial crisis has further tightened PNG's access to liquidity.'[118]

NICTA staff have not examined the situation directly but assume, given the continuing turmoil in global financial markets, that the circumstances have not improved significantly from the ADB description in 2009. (NICTA staff would welcome receiving advice and comment on this point.) It is thus likely that none of the mobile network operators would have easy or privileged access to capital markets within the next two years. However, for the purposes of an assessment of competition, access to capital must be considered in relative terms, not absolute terms. That is, does Digicel have easier or more privileged access to capital markets than either bemobile or Telikom?

NICTA staff understand that Digicel (PNG) Limited is a subsidiary of Digicel Pacific Limited, which in turn is majority owned and controlled by Digicel Group Limited. The Digicel Group is highly profitable: EBITDA for the six month period ending 30 September 2011 was US$545 million.[119] However, it cannot automatically be assumed that as a consequence Digicel PNG has easier access to capital. Indeed, as Digicel Group is active in 30 countries it is reasonable to assume that Digicel PNG must

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[117] BEREC (2005), op.cit. p.6

[118] Asia Development Bank (ADB) (2009), *Report and Recommendation of the President to the Board of directors: Proposed Loan Digicel Mobile Telecommunication Expansion Project (Papua New Guinea)*, p.7, available at www.adb.org/documents/rrps/png/43929-PNG-RRP.pdf

[119] Digicel Group (2011c) *Digicel Group announces 16% revenue growth in its first half results* (media release), available at www.digicelgroup.com/en/media-center/press-releases/achievements/digicel-group-announces-16-revenue-growth-in-its-first-half-results

compete for capital from Digicel Group against all of the other companies in the Digicel Group.

Telikom and bemobile also have substantial investors, including the PNG government. Telikom is wholly government-owned via the Independent Public Business Corporation (IPBC). The owners of bemobile include the IPBC, a consortium of private equity investors that includes Trilogy International Partners and GEMS, and the ADB. Control rests with Trilogy/GEMS. Trilogy also has interests in mobile network operators in Bolivia, the Dominican Republic, Haiti and New Zealand (and Solomon Islands via bemobile PNG).

Although NICTA staff have not examined the financial resources of the international investors in either bemobile or Digicel, it would be reasonable to surmise that both have relationships that improve the PNG businesses' access to capital. It is not possible to determine which of the operators, if any, has easier or more privileged access.

In its submission to the first discussion paper, bemobile claimed that '[d]ue to Digicel's large size, high cash flow relative to its rivals (given their much smaller market share) and well-established multinational presence it seems likely that Digicel would likely have easier access to capital and deeper pockets relative to its market rivals.'[120] However, NICTA staff have no evidence with which to test such a claim (no evidence either way was submitted by bemobile or Digicel).

bemobile's submission also noted that bemobile has recently been granted a loan of US$40 million by the ADB (in addition to the ADB's equity investment)[121] and commented that it 'may offset Digicel's [purported] advantage to some extent'.[122] NICTA staff note that Digicel was also previously granted a loan by the ADB (of up to US$25 million in 2010).[123] NICTA staff are also inclined to agree with the view that any advantages that Digicel may have in relation to access to capital as a result of its size and international presence of its parent companies are likely to be offset, at least in part, by the advantageous ownership arrangements of bemobile.

Under these circumstances NICTA staff are not placing any weight on this factor.

5.14.3 Technological advantages and superiority

Technological advantages may represent a barrier to entry as well as an advantage over existing competitors due to lower production costs or product differentiation.

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[120] Lanigan, E. (2011), *Report for bemobile on retail price discrimination*, p.9

[121] See ADB's summary of the bemobile expansion project (Papua New Guinea and the Solomon Islands) at http://pid.adb.org/pid/PsView.htm?projNo=44937&seqNo=01&typeCd=4

[122] Lanigan, E. (2011), op.cit. p.9

[123] ADB (2009), op.cit.

However, some technological advantages might only be temporary and may therefore not be a permanent source of SMP.[124]

NICTA staff did not find any evidence to suggest that any competitor had a sustainable technological advantage or superiority. Although Digicel and Telikom are currently the only operators with 3G networks, bemobile also has spectrum in which to deploy 3G services and a technology-neutral licence.

NICTA staff also considered whether there was any evidence of technological advantages among Digicel's competitors that might indicate that either Digicel does not have SMP or, if it does, that that SMP would not be persisting. However, NICTA staff did not identify any evidence of such. The mobile technology deployed by all operators in PNG is modern and all available from international vendors. No advantage, assuming any in the first place, is likely to be enduring and no advantage, if any, is in the control of any one operator.

5.14.4 Vertical integration

Vertical integration may give an advantage to the integrated firm over its competitors because control of the upstream or downstream markets may make new market entry more difficult. Vertical integration potentially creates conditions for leverage of market power from an upstream market to a downstream market due to both the incentive and ability for vertically integrated firms to limit entry into downstream markets. Further, vertically integrated multi-product operators may also have a competitive advantage over their competitors if they are in a position to bundle products in way that may either not be able to be replicated by competitors due to a lack of corresponding wholesale products, which in turn might increase the cost of entry.[125]

With the exception of call termination, NICTA staff concluded that there were no vertical market factors to consider at this stage in the development of the market because all existing licensees are vertically integrated and supplying services that are supported entirely by their own platforms.

5.14.5 Product / services diversification

Diversification is where an operator produces a range of products and/or services (which may or may not be in separate markets). When those products/services are bundled, it may make competitive entry into the supply of one or more of the products/services potentially more difficult.[126]

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[124] BEREC (2005), op.cit. p.5

[125] BEREC (2005), op.cit. p.6–7

[126] BEREC (2005), op.cit. p.6

NICTA staff did not consider this factor to be a relevant consideration in this particular assessment of competition as service bundling is not a common feature in the market and is not expected to become one within the next two years. Accordingly, NICTA staff have disregarded this factor.

5.14.6 Economies of scope

Economies of scope exist where average costs for one product are lower as a result of it being produced jointly with other products by the same operator. Cost savings may be made where common processes are used in production. Economies of scope are common where networks exist, as the capacity of the network can be shared across multiple products. Similar to economies of scale, economies of scope can be a barrier to entry as well as an advantage over existing competitors. For example, if the existence of economies of scope requires entrants to enter in more than one market simultaneously, this may require additional expertise and more capital, which may in turn mean the costs are higher to enter the market.[127]

NICTA staff did not consider this factor to be a relevant consideration in this particular assessment of competition as all mobile networks have the ability to provide the full suite of mobile services (with the possible exception of certain high-speed data services, but which were not included in the definition of the market). In its submission to the first discussion paper, bemobile expressed the same view.[128] Accordingly, NICTA staff have disregarded this factor.

5.14.7 A highly developed distribution and sales network

Well-developed distribution systems are costly to replicate and maintain, and may even be incapable of duplication. They may represent a barrier to entry as well as an advantage over existing competitors.[129]

In the first discussion paper, NICTA staff noted that it had no evidence to suggest that this was a relevant consideration in this particular assessment of competition. The issue is not whether Digicel has a good distribution and sales network, but whether it has one that confers enduring advantage relative to anything that bemobile or Telikom might establish. Neither bemobile nor Digicel commented on this point in their submissions in response. Accordingly, NICTA staff are inclined to conclude that this factor is not relevant in the circumstances and disregard it in the current assessment.

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[127] BEREC (2005) op.cit. p.6

[128] Lanigan, E. (2011), op.cit. p.10

[129] BEREC (2005), op.cit. p.7

5.14.8 Customers' ability to access and use information

Limited customer access to and use of reliable information on prices and other aspects of the services can dampen competition by reducing the degree to which customers act upon differences between competitors. As a result, operators are better able to act independently of customers.[130]

There is generally a considerable amount of relevant information that is made available to customers in PNG. Information about mobile service coverage, pricing and options is prominent in general advertising and outdoor media. More detailed service information is also available from retail shops, customer care telephone services and from the licensees' websites. Digicel's website provides more detailed information about its services than bemobile's website.[131] NICTA staff are not inclined to see this factor as supporting the creation or maintenance of a position of SMP in the market.

5.15 Proposed conclusion

All things considered, NICTA staff believe that the consideration of the factors discussed above indicate that Digicel has SMP in the retail mobile services market. NICTA staff consider this conclusion to be clear and compelling, taking the total market context into account. Consequently, the market cannot be considered to be effectively competitive.

The factors that—in totality—NICTA staff found most compelling were:

- Digicel's high and prevailing market shares;
- Digicel's network reach and being first in with a high coverage of both territory and population;
- Digicel's price leadership and its ability to sustain on average higher prices than its competitors;
- Digicel's use of club effects to reinforce its market share and overall market position.

In the absence of ex ante regulation, NICTA staff believe that Digicel's position of SMP would be likely to endure over the forthcoming two years and likely for longer than that.

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[130] BEREC (2005), op,cit. p.13

[131] NICTA staff note that for a period of about 6–12 weeks during the course of the inquiry, an important piece of information—namely, Digicel's prepaid tariff for off-net calls to bemobile—was removed from Digicel's website. This was brought to the attention of NICTA staff by bemobile. The removal of that information was of concern to NICTA staff but was replaced with revised pricing information in the week during the first week of March 2012. Digicel advised that that was a 'temporary unintentional omission'.

5.16 International precedents

Digicel noted in its submission that '[t]he market structure [in PNG] is typical of mobile industries worldwide, yet [findings of] dominance is rare.'[132] NICTA staff note that findings of SMP in retail mobile markets are relatively common in developing economies, particularly in recent years as the respective national regulators have become fully operational. For example:

- in Kenya in 2011, the CCK found Safaricom to have SMP in the retail market for voice and SMS services;[133]
- in the United Arab Emirates in 2011, the TRA made a preliminary finding that Etisalat has SMP in the retail market for post-pay mobile voice and data services (the TRA has not yet published its final decision);[134]
- in Vanuatu in 2009, the Interim Telecommunications Regulator found Digicel (Vanuatu) to be dominant in the market for retail mobile services;[135]
- in Colombia in 2009, the CRC found COMCEL to have SMP in the retail market for outgoing mobile voice calls;[136]
- in Qatar in 2008, ictQATAR found Qtel to be dominant in the retail market for 'publicly available national telecommunications services provided via a mobile device';[137] and
- in Turkey in 2005, the Information and Communication technology Authority (ICTA) of Turkey designated Turkcell as having SMP in the retail GSM mobile telecommunication services market.[138]

Specific questions for stakeholders

Question 9: Do you agree with NICTA staff's proposed conclusion that Digicel has a substantial degree of market power in the retail mobile services market? Provide evidence and data to support your answer.

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[132] Digicel (2011a), op.cit. paragraph 90(e)

[133] Communications Commission of Kenya (CCK) (2011) *Notification of the Commission's intention to declare regulated services: Regulated services in specific/relevant markets in the telecommunications market in Kenya*, p.8, available at www.cck.go.ke/links/consultations/current_consultations/Regulated_Services.pdf

[134] Telecommunications Regulatory Authority of UAE (TRA) (2011b), *Competition assessment and proposed remedies in relevant markets: consultation*, p.16, available at www.tra.gov.ae/download.php?filename=consultation/RPT-%20comp%20assess%20and%20remedies-%20FINAL%20-%20160611.pdf

[135] Telecommunication and Radiocommunication Regulator (TRR), *Designation order: Digicel (Vanuatu) Limited*, available at www.trr.vu/attachments/036_1.b.%20Digicel%20Dominance%20Notice.pdf

[136] Comisión de Regulación de Comunicaciones (CRC) (2009), Resolution 2171 of 2009, available (in Spanish) at www.crcom.gov.co/?idcategoria=55407

[137] ictQatar (2008) *op.cit*

[138] Turkcell, (2005), *Turkcell Iletisim Hizmetleri A.S. reports year end 2005 results*, p.7, available at www.turkcell.com.tr/InvestorReportLibraryEN/announcements_2006_0227_4Q05_Final.pdf

6 Is SMP harming competition or consumers or have potential to do so?

6.1 Summary

NICTA staff have analysed Digicel's pricing structure for, and pricing of, pre-paid on-net and off-net voice calls and SMS and concluded that, given Digicel's SMP in the retail mobile services market, Digicel has both the *incentive* and the *ability* to engage in anti-competitive price discrimination. Analysis of the scale of its discrimination between on-net and off-net prices and the extremely high proportion of Digicel's national voice traffic that remains on-net suggests that Digicel is currently price discriminating in a manner that is anti-competitive.

6.2 Background

To have SMP in a market is neither illegal nor necessarily problematic. However, in the present case, NICTA staff believe that SMP in the retail mobile services market gives Digicel both an incentive and the ability to use the tariff-mediated network externalities created by price discriminating between on-net and off-net calls to generate club effects so strong that they increase the barriers to expansion and entrench Digicel's SMP. NICTA staff consider that this creates a substantial risk of impeding the long term development of effective competition in retail mobile services market and potential market foreclosure.

Before discussing the nature and scale of these issues in detail, NICTA staff first address the competition problems raised in its first discussion paper.

6.3 Competition problems considered in the first discussion paper

In the first discussion paper, NICTA staff identified four types of anti-competitive pricing behaviours that are recognised as standard competition problems[139] and which NICTA staff thought were relevant for discussion given the nature of the bemobile's original complaint. Those four behaviours were:

- anti-competitive cross-subsidy;
- predatory pricing;
- excessive pricing (as an abuse of a dominant position); and
- anti-competitive price discrimination.

[139] BEREC (2006), *Revised ERG Common Position on the approach to appropriate remedies in the ECNS regulatory framework,* ERG (06) 33. p.99, available at www.erg.eu.int/doc/meeting/erg_06_33_remedies_common_position_june_06.pdf

Each will be discussed in turn.

6.3.1 Anti-competitive cross-subsidisation

Cross-subsidisation occurs when an operator uses revenue from one service to subsidise losses made on another service. This behaviour may be considered anti-competitive where the operator responds to competitive challenges in one market by pricing competitive products below marginal production costs and cross-subsidises the consequent losses from higher profits it earns in non-competitive markets. Such cross-subsidisation is generally considered harmful to effective competition because an economically efficient operator without a similar ability to cross-subsidise its own competitive services may be unable to match the subsidising operator's low prices in the competitive market and thus may be forced out of business. In short, anti-competitive cross subsidy pricing is considered harmful to competition because it can restrict competitors' sales and thereby foreclose the market to competition.[140]

In the first discussion paper, NICTA staff tentatively concluded that there was no *prima facie* case of anti-competitive cross-subsidy by Digicel in the relevant market (as defined in the first discussion paper). As NICTA staff did not receive any information in response to that first discussion that prompted it to either examine the matter further or reconsider its tentative conclusion, NICTA staff remain of the view that there is no evidence to suggest that Digicel is engaging in any anti-competitive cross-subsidisation.[141] Further, NICTA staff no longer consider anti-competitive cross-subsidisation to be a relevant competition problem or potential source of harm that warrants examination as part of the present inquiry.

6.3.2 Predatory pricing

Predatory pricing occurs when an operator with SMP temporarily reduces its retail prices below the level justified by competitive conditions in order to force a competitor from the market or to deter a competitor from competing.[142] That is, retail prices are lowered to levels below cost. Once the predatory pricing achieves its purpose of removing a competitor, the operator is then able to raise its prices above the competitive level. In short, predatory pricing is considered harmful to competition as it can restrict competitors' sales and thereby foreclose the market to competition.[143]

In the first discussion paper, NICTA staff tentatively concluded that there was no *prima facie* case of predatory pricing by Digicel in the relevant market (as defined in the first discussion paper).

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[140] BEREC (2006), op.cit. p.39

[141] NICTA staff note that Digicel denied it was engaging in anti-competitive cross subsidisation.

[142] OECD (1993) *Glossary of Industrial Organisation Economics and Competition Law*, compiled by R. S. Khemani and D. M. Shapiro, available at www.oecd.org/dataoecd/8/61/2376087.pdf

[143] BEREC (2006), op.cit. p.40

In it response to the first discussion paper, bemobile described Digicel's pricing of its on-net calls as 'potentially predatory pricing'[144] and commented that a 'vertical price squeeze is a form of predatory pricing and can occur through a combination of high MTRs and low on-net pricing by the largest network.'[145] NICTA staff have a different view and consider that a price (or margin) squeeze is best classified as an *effect* rather than as an anti-competitive behaviour in its own right. This is because a price squeeze can be the result of a number of different types of behaviours, for example, price discrimination in an upstream market and/or predatory pricing in a downstream market. This approach is consistent with the common position of NRAs in other countries such as the Member States of the European Union.[146]

In any case, predatory pricing typically involves the lowering of retail prices to levels that are below cost (and thus incurring losses that the practitioner expects to recoup after its competitors exit the market). There was no evidence, information or even opinion submitted to NICTA staff that suggests that Digicel is pricing below its avoidable costs.[147] Further, the evidence considered in the first discussion paper showed that Digicel's retail prices (for both on-net and off-net calls) was above its costs (that is, above the price of termination that was used as a proxy for costs in the first discussion paper).[148]

Accordingly NICTA staff remain of the view that there is no evidence to suggest that Digicel is engaging in predatory pricing. Further, NICTA staff no longer consider predatory pricing to be a relevant competition problem or potential source of harm that warrants examination as part of the present inquiry.

6.3.3 Excessive pricing

Markets are most efficient (as measured by productive and allocative efficiency) when prices are based on the interaction of both demand and supply factors and prices are the clearing mechanism matching demand and supply. When prices are higher than at competitive levels, consumers are worse off and overall welfare is reduced.

Prices can be considered excessive if they allow a firm to sustain profits higher than it could expect to earn in a competitive market (i.e. super-normal profits). A firm with SMP may set its prices above costs at a level that maximizes its profits given consumers' demand. This is considered potentially harmful as it may mean that quantity, consumer surplus and total surplus (total welfare) will fall short of their potential values under conditions of effective competition.[149]

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[144] bemobile (2011a), op.cit. p.43

[145] bemobile (2011a), op.cit. p.47

[146] BEREC (2006), op.cit. p.38

[147] NICTA staff note that Digicel denied that it was engaging in predatory pricing.

[148] Refer Figure 2 on page 14 in the first discussion paper.

[149] BEREC (2006), op.cit. p.34

In the first discussion paper, NICTA staff stated that there was some prima facie evidence to suggest that Digicel may be engaging in excessive pricing, but that there was insufficient information to form a more definitive view one way or the other. Digicel, in its submission, denied that it was engaging in excessive pricing. bemobile, in its submission, commented that:

> 'Excessive pricing can either be interpreted in SMP terms where an operator is generating excess profits for a particular service, or, as is the case here that excessive pricing is being used as a strategic tool to bring about some other effect in the market. It is this latter reason that prevails in this case and has been the focus of much of our submission and accompanying economist report.' [150]

NICTA staff address that 'latter reason' described by bemobile in section 6.4 in the context of price discrimination. With respect to the "former reason" for excessive pricing described by bemobile (which is essentially the same type of excessive pricing behaviour that NICTA staff considered in the first discussion paper) as no additional evidence or information was submitted on that aspect, NICTA staff are not in a position to modify, correct or change the tentative conclusion that was expressed in the first discussion paper (i.e. that there is some prima facie evidence that suggests Digicel may be engaging in excessive pricing but overall there is currently insufficient evidence to form a view on the matter). However, after further consideration, NICTA staff no longer consider excessive pricing (as described above by NICTA staff) to be a relevant competition problem or potential source of harm that warrants examination as part of the present inquiry.

6.3.4 Anti-competitive price discrimination

Price discrimination[151] occurs when customers in different market segments are charged different prices for the same product or service for reasons unrelated to costs.[152] Price discrimination is not necessarily anti-competitive and can be a pro-competitive welfare-maximising strategy. In the presence of fixed costs, price discrimination can be welfare enhancing as it enables the supplier to recover relatively more fixed and/or common costs from those consumers who value the product or service more highly and thus have a higher willingness to pay for it. By doing so, the

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[150] bemobile (2011a), op.cit. p.48

[151] In economic theory there are three forms of price discrimination. In first degree price discrimination, a firm is able to charge each individual consumer a price equal to his or her willingness to pay, thus extracting all the consumer surplus. In second degree price discrimination, a firm is not able to identify the willingness to pay of individual consumers or groups of consumer and so designs different pricing schemes into which consumers "self-select" according to their demand for the product or service. For example, in telecommunications this could take the form of offering different tariff bundles aimed at low, medium and high volume users, into which consumers will self select. In third degree price discrimination, a firm is able to identify and separate different customer groups and hence offer different tariffs to each group. In telecommunications, a common example of this is the use of distinct tariffs for business and residential users. The focus in this discussion paper is on third degree price discrimination.

[152] OECD (1993) op.cit.

supplier may be in a position to reduce the prices to those customers whose demand is more price sensitive, thereby leading potentially to a higher level of overall demand and consumer welfare. However, where one or more of the discriminatory prices are set at levels that are above costs, total consumer welfare will usually fall short of its maximum potential value under competition. In such a context, price discrimination may be considered harmful as it can lead to allocative inefficiencies and thus economic welfare losses.[153]

However, there is another facet to price discrimination that was not considered in the first discussion paper but which was highlighted in bemobile's submission and NICTA staff's subsequent research and analysis. Price discrimination may also be anti-competitive where it is used with the intent or effect of creating a barrier to market entry or expansion or to force competitors from the market.[154] It is this second aspect of price discrimination, discussed in detail in the remainder of this section, that is now NICTA staff's principal concern in relation to Digicel's SMP in the retail mobile services market.

NICTA staff note that, in its submission to the first discussion paper, Digicel denied that it was engaging in anti-competitive price discrimination.

6.4 Anti-competitive price-discrimination and tariff mediated network externalities

MNOs with SMP in a retail market have an incentive to price discriminate between on-net and off-net calls for strategic reasons rather than for reasons relating to costs. This is evident in the academic literature and from ex post investigations of anti-competitive price discrimination in other countries. NICTA staff recognise that there is neither a prima facie case for or against on-net/off-net price discrimination as anti-competitive conduct, hence it is commonly found in many mobile markets that are effectively competitive. However, analysis of Digicel's on-net/off-net price discrimination practices in PNG shows that Digicel's pricing structure is highly discriminatory in a number of ways that are not based on any differences in underlying costs and which are excessive by international comparisons. This indicates that Digicel has, and is, acting on the strategic incentive and price discriminating between on-net and off-net calls in a way that is anti-competitive. The extremely high proportion of total mobile traffic in PNG that remains on-net also suggests that on-net/off-net price discrimination is severely distorting the distribution of traffic. Given Digicel's SMP in the retail mobile services market, NICTA staff do not believe that Digicel is likely to refrain from acting on the opportunity or incentive to engage in anti-competitive price discrimination or refrain from its current on-net/off-net price discrimination practices. In fact, rational

[153] BEREC (2006), op.cit. pp.34, 40

[154] OECD (1993), op.cit.; Commonwealth of Australia (2003), *Review of the Competition Provisions of the Trade Practices Act*, p.92, available at http://tpareview.treasury.gov.au/content/report.asp.

competitors would respond to the incentive and take the opportunities of this kind that are available to improve their commercial position.

6.4.1 The incentive and its consequences

The incentive for a mobile network operator with SMP to price discriminate between on-net and off-net calls for strategic reasons, as distinct from reasons related to cost differentials, is well documented in the academic literature and by other regulatory authorities.

Cave, Stumpf and Valletti (2006) have noted:

> ‘One specific way an incumbent with a secured customer base could try to put an entrant in a weaker position, is to introduce particular retail pricing structures that distinguish between calls made to own customers (on-net calls) and calls made to rival customers (off-net calls). By making on-net calls cheaper than off-net calls, a potential new customer would be more inclined to join, ceteris paribus, a bigger incumbent than a smaller entrant since she would make relatively more on-net calls. The entrant would have difficulties in attracting customers. Should this be true, this type of price discrimination would be harmful to competition and might require intervention.’[155]

The European Commission has noted that:

> ‘...in the presence of call externalities mobile networks have strong incentives to implement on-net/off-net price differentials due to:
>
> (i) high mobile-to-mobile termination charges which exceed marginal costs; and
>
> (ii) their strategic incentives to reduce the number of calls that subscribers on rival networks receive, reducing the attractiveness of rival networks and hence their ability to compete.’[156]

The existence and potential consequences of this incentive has also been recognised by the Body of European Regulators of Electronic Communications[157] and the national regulatory authorities in Columbia,[158] Kenya,[159] Ireland,[160] New Zealand,[161] Namibia,[162] Qatar,[163] and the United Kingdom[164] among others.

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[155] Cave, M. et.al. (2006), op.cit. p.85

[156] European Commission (2009), *Explanatory note accompanying the EC Recommendation on the Regulatory Treatment of Fixed and Mobile Termination Rates in the EU - SEC(2009) 600*, page 18 http://ec.europa.eu/information_society/policy/ecomm/doc/implementation_enforcement/eu_consultation_procedures/explanatory_note.pdf

[157] BEREC (2007) op.cit. p.84

[158] CRC (2009) op.cit.

[159] CCK (2010a) op.cit.

Jeon, Laffont and Tirole (2004) show that the call externality creates strong incentives for an MNO to 'strategically manipulate' its off-net prices in order to reduce the number of calls made to the rival network, thereby reducing the attractiveness of the rival network to subscribers.[165] They also show that a large network will tend to charge a higher off-net price, and have a greater on-net/off-net differential, than a small network.

Birke and Swann (2006) found that 'the high price of off-net calls cannot only be a *result* of market power, but can be a significant *source* of market power, which can especially be used to pre-empt entry by new competitors'.[166]

Armstrong and Wright (2007) note that 'the chief anti-competitive motive [of a mobile network operator] to set high off-net call charges' is to harm its rivals' abilities to compete by encouraging fewer calls to be made to the subscribers of rival networks.[167]

Hoering (2007) considered on-net/off-net price discrimination in the context of price predation. He considered the scenario of both 'full predation', in which the large network seeks to induce a smaller network to exit the market by driving down its market share and profits by setting arbitrarily low on-net prices and high off-net prices, and 'limited predation', in which the larger network seeks to restrict the small network's profits and cash flows (rather than its complete exit from the market) to make it more difficult to invest in either network improvement or customer retention. Hoering found that, given call externalities, the difference between the larger network's on-net and off-

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[160] Commission for Communications Regulation (ComReg) (2004), *Response to Consultation and Notification to the European Commission – Wholesale voice call termination on individual networks* Doc. No. 04/62a, paragraph 4.35, available at www.comreg.ie/publications/response_to_consultation_and_notification_to_the_european_commission_-_wholesale_voice_call_termination_on_individual_mobile_networks.506.101658.p.html

[161] Commerce Commission (2010) *Reconsideration report on whether the mobile termination access service (incorporating mobile-to-mobile voice termination, fixed-to-mobile voice termination and short-message-service termination) should become designated or specified services—Public version*, available at www.comcom.govt.nz/assets/Uploads/Mobile-Termination-Access-Services-Reconsideration-Report-16-June-2010-public-version.pdf

[162] Namibian Communications Commission (NCC) (2011), *Price cap on off-net retail prices*, pp.11–12, available at www.researchictafrica.net/countries/namibia/NCC%20Retail%20Price%20Regulation.pdf

[163] ictQATAR (2011) *Order of the Supreme Council for Information and Communications Technology (ictQATAR) setting forth the rules and instructions for on-net/off-net price differentiation for dominant service providers in Qatar*, available at www.ictqatar.qa/sites/default/files/documents/2011%2005%2015%20Order%20On-net_Off-net%20FINAL.pdf

[164] Ofcom (2011), *Wholesale mobile voice call termination: statement, non-confidential version*, chapter 8, available at http://stakeholders.ofcom.org.uk/binaries/consultations/mtr/statement/MCT_statement.pdf

[165] Jeon, D., Laffont, J-J., and Tirole, J. (2004) 'On the receiver pays principle', *RAND Journal of Economics*, 35, 85-110, available at www.econ.upf.edu/~jeon/Onthe.pdf

[166] Birke, D. and Swann, G. (2007), op.cit.

[167] Arstrongm N. And Wright, J. (2007) 'Mobile call termination un the UK', UCL, September, p.18, available at http://eprints.ucl.ac.uk/4078/1/4078.pdf

net prices is driven by 'the difference in market shares [between the large and small network operators] and strategic considerations'.[168]

Harbord and Pagnozzi (2008) note that 'strategically inducing network effects can be a profitable strategy for attracting and maintaining market share, and for pre-empting entry or retarding the growth of smaller networks'.[169]

The consequences of a mobile network operator acting on that incentive can be harmful to the development of effective competition. As explained in section 2.8, such price discrimination can be used to induce a club effect and network effects that are so strong that they effectively lock customers in to the larger network and create a barrier to switching that in turns creates a barrier to expansion. Cabral (2011) suggests that the skewed market share distributions induced by on-net/off-net price discrimination tend to endure for a long time, helping to reinforce the dominance of the larger network operator.[170] This in turn can also increase the barriers to entry and thus deter future potential competition in the retail mobile services market. Further, such price discrimination can deter the making of calls to the subscribers of a rival network, reducing the benefit (the call externality) enjoyed by the subscribers of that network and reducing that network operator's profits and cash flows and, thus, its ability to reinvest in the factors of competition. Jeon, Laffont and Tirole (2004) concluded that, at its extreme, this can lead to a situation where off-net call charges are so high that all off-net calling is completely eliminated—a scenario they called a 'connectivity breakdown'.[171]

6.4.2 Evidence from ex post investigations in other jurisdictions

NICTA staff are conscious of not relying only on the conclusions drawn from economic modelling in academic literature. These insights need to be applied to the market circumstances in PNG. All of those models tend to have been developed to reflect mobile markets in developed countries, in particular, markets in the European Union where the issue of on-net/off-net price discrimination has been considered extensively in the context of mobile termination pricing. Consequently, some of the key assumptions that underpin those economic models do not reflect the circumstances that exist in PNG. For example, Jeon, Laffont and Tirole (2004) assumed equally sized mobile networks; Calzada and Valletti (2007) assumed a multi-firm industry, and Hoernig (2007) and Cabral (2011) among others assumed that mobile termination rates were set at cost by a regulator.

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[168] Hoernig, Steffen, 2007 'On-net and off-net pricing on asymmetric telecommunications networks', *Information Economics and Policy*, Elsevier, vol. 19(2), pages 171-188, available at www.anacom.pt/streaming/Estudo8mai07.pdf?categoryId=241362&contentId=481092&field=ATTACHED_FILE

[169] Harbord, D. And Pagnozzi, M. (2008), op.cit.

[170] Cabral, L. (2011) op.cit.

[171] Jeon, D., et.al (2004) op.cit.

However, the potential anti-competitive consequences of on-net/off-net price discrimination are not merely theoretical issues that exist only in academic literature. The effects described above have been found to exist in retail mobile markets in other countries following ex post investigations of alleged anti-competitive behaviour. Two cases from the French competition authority covering all five of France's overseas regions are summarised below.[172] Investigations by the national competition authorities in Belgium in 2008/9[173] and Slovenia in 2011[174] provide additional examples. NICTA staff also note that competition regulators in other countries—notably Chile in 2005,[175] Portugal in 2006[176] and Jamaica in 2011[177]—have also expressed concerns during merger reviews about anti-competitive price discrimination between on-net and off price mobile calls.

French Guiana, Guadeloupe and Martinique

In December 2004, the French *Conseil de la concurrence* (the former name of the competition regulator) issued an injunction requiring Orange Caraïbe (a mobile network operator in French Guiana (in South America) and in Guadeloupe and Martinique (in the Caribbean) to ensure that the difference between its off-net and on-net prices to be no greater than the difference between the costs incurred by Orange Caraïbe to terminate these two types of calls.[178] In its decision, the *Conseil* noted that it did not consider price discrimination to be anticompetitive per se and recognised that it can be legitimate when based on a difference in costs or the price elasticity of demand. However, in the specific case of on-net/off-net calls, the Conseil found that price discrimination could distort competition, particularly when made by an operator in a

[172] The French overseas regions (also called overseas departments) are administrative divisions of France and thus part of the European Union. French laws and regulations (reflecting the European Commission's directions) generally apply in the French overseas regions as they do in mainland France. Thus the French competition authority has justification.

[173] Belgian Competition Authority (2009) *The Competition Council imposes a fine of 66.3 million euros on mobile operator Proximus for abuse of a dominant position* (media release), available at http://economie.fgov.be/en/binaries/press_release_26052009_en_tcm327-67953.pdf

[174] Refer Decision No. 306-14/2009-239 of the Slovenia Competition Protection Office, 16 February 2011, www.uvk.gov.si

[175] Tribunal de Defensa de la Libre Competencia (TDLC) (2005) *Resolución No. 02/2005, Consulta sobre toma de control de BellSouth Comunicaciones S.A. y Bellsouth Inversiones S.A. por parte de Telefónica Móviles S.A. de España*, dated 4th January 2005 and regarding the acquisition of BellSouth by Telefónica Móviles, available (in Spanish) at www.tdlc.cl/DocumentosMultiples/Resoluci%C3%B3n-2-2005.pdf

[176] The proposed merger was between the first and third largest MNOs, TMN and Optimus, and was a consequence of Sonaecom's proposed (but ultimately disallowed) acquisition of Portugal Telecom. See *Autoridaae da Concorrência* (2006) Decision Case AC-I-08/2006-Sonaecom / PT, available (in Portuguese) at www.concorrencia.pt/SiteCollectionDocuments/Noticias_e_Eventos/Comunicados/2006_08_final_net.pdf. The Portuguese Competition Authority subsequently solicited voluntary commitments from the two MNOs concerned that the merged entity would discontinue such price discrimination. The PCA approved the merger but it ultimately did not proceed.

[177] Fair Trading Commission (2011), *Investigation into the acquisition of Oceanic Digital (Jamaica) by Digicel Jamaica Limited pursuant to section 17 of the Fair Competition Act: Staff Report*, paragraphs 97–101, available at www.jftc.gov.jm/Libraries/Case_Reports/Case_No_6997_Proposed_Acquisition_of_Claro_by_Digicel.sflb.ashx

[178] Decision 04-MC-02 of 9 December 2004, see *Conseil de la concurrence* (2004) *Press release: Mobile telephony in Martinique, Guadeloupe and Guyana: The Counseil de la concurrence hands down interim measures against Orange Caraïbe*, 9/12/2004, available at www.autoritedelaconcurrence.fr/user/standard.php?id_rub=134&id_article=364

dominant position. The *Conseil* observed that although price discrimination between on-net/off-net calls was common in mainland France, the practice had particular effects in the Caribbean 'as a result of the very specific structure of the geographical market, where competition is between two operators with very unequal market shares (82% and 18% respectively)'.[179]

This decision was upheld by the Paris Court of Appeals in January 2005. The Appeals Court stressed that:

> '[When price discrimination is] applied by an operator in a dominant position it is likely to strengthen it through a network effect, or club effect, inasmuch as customers are encouraged to limit the volume of calls made to the competing operator and to take into account the network to which their main correspondents belong when making an initial purchase or a renewal; that this is all the truer when such a practice is observed on a narrow market (under one million potential customers), featuring only two players in highly asymmetrical positions'. [180]

In 2009, the *Autorité de la concurrence* (the new name of the competition authority) having considered the allegations in greater detail, found that Orange Caraïbe's price discrimination between on-net/off-net calls from 2003 to 2004 constituted an abuse of its SMP in the retail mobile services markets in Martinique, Guadeloupe and Guyana.[181] The *Autorité* found that 'the purpose and effect of such a practice was to consolidate the position of Orange Caraïbe by artificially making it more difficult for competing companies to enter the market and expand'.[182] The *Autorité* fined Orange Caraïbe (and its parent company France Telecom) €63 million. The *Autorité's* ruling was upheld on appeal by the Paris Court of Appeals in September 2010, although the fine was slightly reduced to €60 million.

Reunion and Mayotte

In September 2009, the *Autorité de la concurrence* imposed an injunction on SFR[183] La Réunion (SRR), the dominant mobile network operator on the islands of Reunion and Mayotte (of the east coast of Africa), to prevent it from discriminating between on-net and off-net calls except to the extent that the different prices reflected difference in costs.[184] In doing so the *Autorité* noted:

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[179] Ibid

[180] *Autorité de la concurrence* (2011) *Digital Economy*, (submission by France to the OECD's Competition Committee), p.6, available at www.autoritedelaconcurrence.fr/doc/eco_numerique_ocde_oct11_uk.pdf

[181] Ibid

[182] Ibid

[183] SFR is a mobile phone operator in mainland France. SFR originally stood for Société Française de Radiotéléphonie.

[184] Decision 09-MC-02 of 16 September 2009, available (in French) at http://www.autoritedelaconcurrence.fr/pdf/avis/09mc02.pdf

> 'Practically speaking, the consequence on this pricing is to render calls placed within the SRR network attractive and to create an image that the other operators are particularly "expensive to call". This therefore serves to mechanically promote the largest network while generating an artificial "club effect"
>
> firstly, at the time of their initial purchase or of a renewal, consumers will have a tendency to favour the largest pool of users, while appreciating the possibility of calling and being called at a lesser cost by the largest possible number of correspondents;
>
> secondly, SRR customers are encouraged to limit the volume of calls placed to a competing operator and to encourage their friends and relatives to use the same operator as they do.
>
> ...
>
> These practices have a significant impact on the ability of other operators [Orange, with market share of 25–30%], and of Outremer Télécom [market share of 5–10%] in particular, to provide lively competition on the mobile telephony service markets on Reunion and Mayotte.[185]

The *Autorité* subsequently fined SRR €2 million in January 2012 for not fully complying with the injunction.[186]

6.4.3 Evidence from PNG

NICTA staff's analysis of Digicel's pre-paid pricing structure for on-net and off-net calls identified three key concerns:

- A price structure that is highly discriminatory against off-net calls and which is not based on any difference in costs between the termination of on-net and off-net calls;
- Off-net pricing that discriminates between different termination networks which is not based on any differences in the costs of terminating calls on those networks; and
- Price discrimination between on-net and off-net calls that is of an excessively high magnitude.

These three issues are discussed below. NICTA staff focused on the pricing of pre-paid services (as distinct from post-paid contract services) because prepaid constitutes the overwhelming majority of the market (99% of total subscribers and 97% of total

[185] *Autorité de la concurrence* (2009) Press release: The Autorité de la concurrence imposes emergency measures on SRR in order to re-establish competition on Reunion and Mayotte before the holiday season, 17/9/2009, available at www.autoritedelaconcurrence.fr/user/standard.php?id_rub=316&id_article=1258

[186] Decision 12-D-05 of 24 January 2012, available (in French) at www.autoritedelaconcurrence.fr/pdf/avis/12d05.pdf

revenues).[187] The discussion below reflects current prices (i.e. current as of 21st March 2012[188]). NICTA staff also examined the pricing of SMS/MMS messages but did not consider there to be problems of a similar nature or scale as those associated with Digicel's pricing of voice calls.[189]

NICTA notes that bemobile and Telikom have adopted a similar (though not identical) pricing structure to Digicel and have off-net to on-net price ratios that are similar to those of Digicel. However, NICTA's inquiry is concerned with SMP and neither bemobile or Telikom were found to have SMP in the retail mobile services market. Consequentially, consideration of bemobile's and Telikom's pricing structures and price discrimination practices is not relevant to the question of whether or not Digicel's SMP combined with its on-net/off-net price discrimination practices are harmful to competition or consumers' interests or have the potential to be harmful to competition or consumers' interests. To the extent that bemobile's and Telikom's pricing structures and prices are mentioned below, it is only to provide context and a point of reference[190] for consideration of Digicel's pricing structure and prices.

6.4.3.1 A discriminatory price structure

Digicel's price structure for on-net calls charges one rate for the first minute of a call and a much lower rate for the second and each subsequent minute of a call. However, the same structure is not applied to off-net calls where the same (high) rate applies to every minute of the call. This is shown in Figure 9. There is no evidence that the different price structure relates to any difference in costs between the termination of a call on-net and the termination of a call off-net.

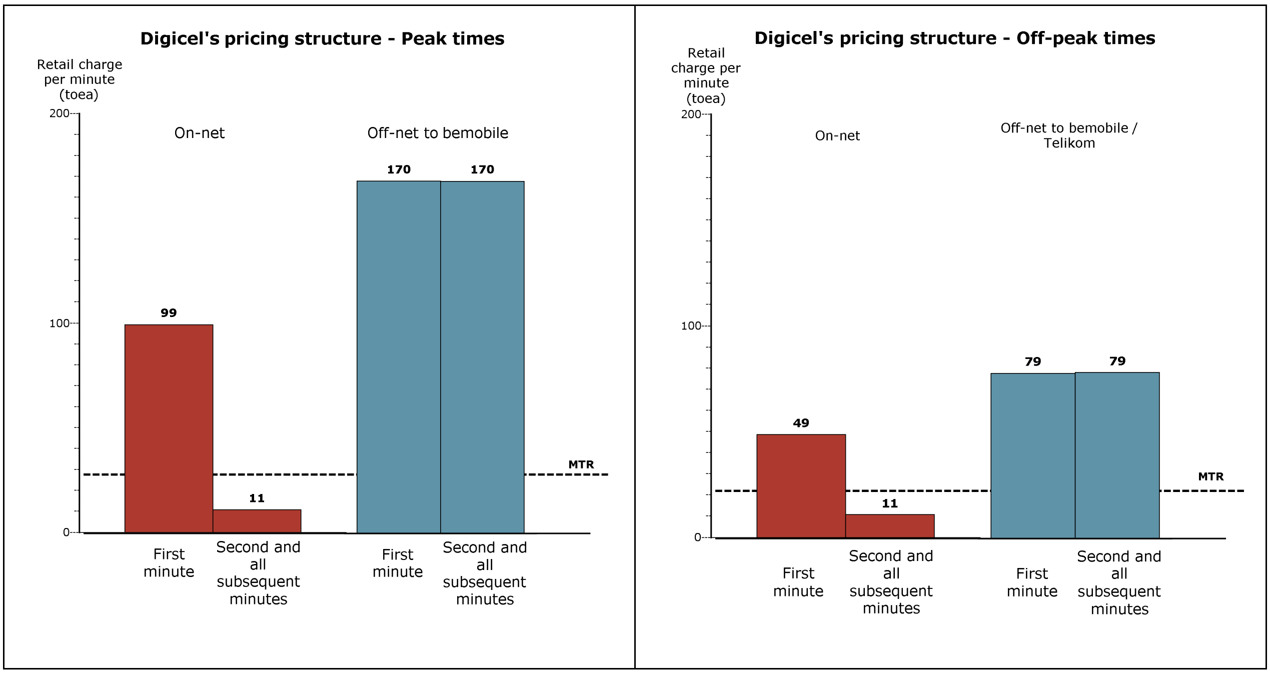
[187] NICTA staff also tended to focus on the peak time prices because off-peak prices are typically not related to costs, which may approximate zero if based on marginal short run costs. Off-peak prices are instead typically based on management judgements about load shifting and matching competitive offers.

[188] NICTA staff note that Telikom introduced new on-net and off-net pricing after this date, with effect from 19th April 2012.

[189] NICTA staff also note that as a consequence of price changes by Digicel in Q1 2012, there is currently no price discrimination between the sending of SMS messages on-net and off-net.

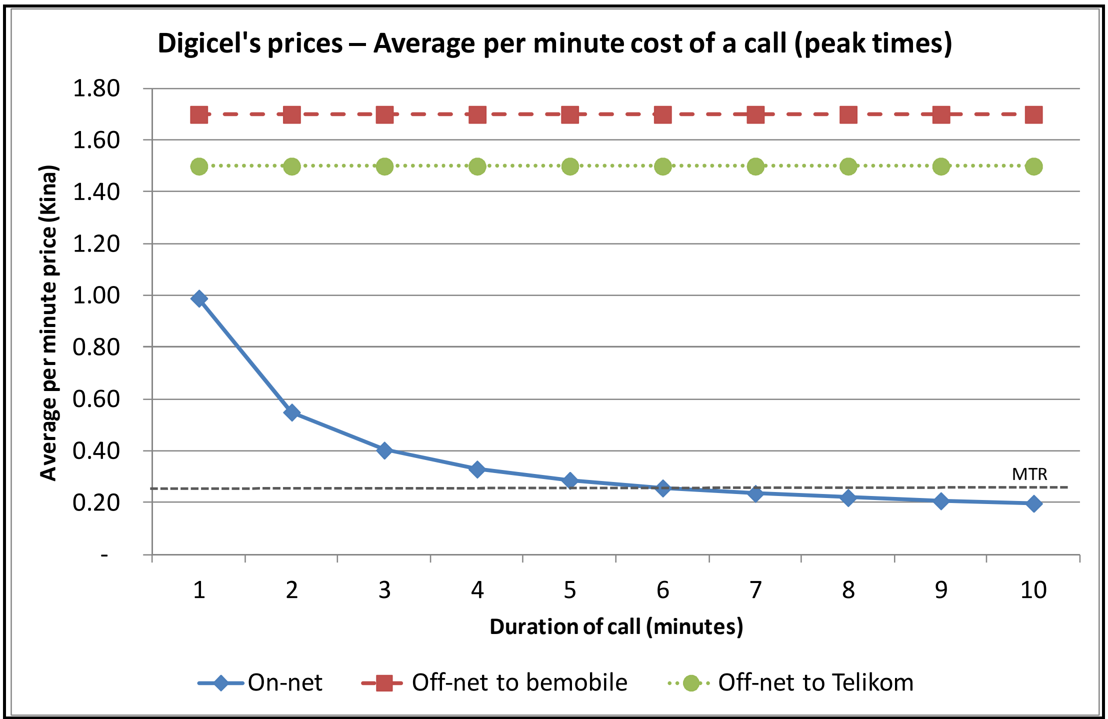
[190] Note that principle 5 of NICTA's guiding principles for retail price regulation (discussed in section 7.3) reflects NICTA's intention not to set retail price floors or ceilings based on the retail prices of other market participants.

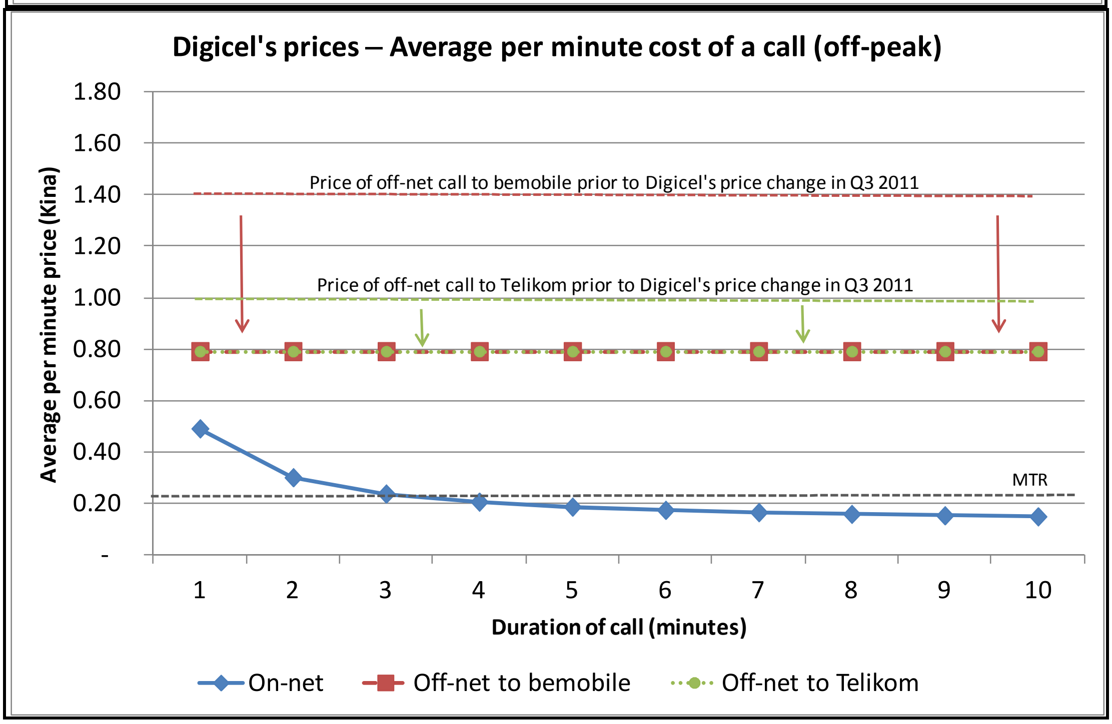
Figure 9: Structure of Digicel's on-net/off-net pricing



As a consequence of these different price structures, the average price per minute for an on-net call continuously decreases the longer the duration of the call. In contrast, the average price per minute for an off-net call remains fixed at the same high rate for the entire duration of the call. This is shown in Figure 10. This creates a strong disincentive among Digicel subscribers against the making of off-net calls—in particular, off-net calls of a long duration. At the same time it creates a strong incentive for Digicel subscribers to ensure that as many outgoing calls as possible—and calls of a long duration in particular—are on-net. This in turn is likely to stimulate a very strong club effect among existing Digicel subscribers and potential first-time mobile subscribers.

Figure 10: Comparison of average price per minute for prepaid on-net and off-net calls

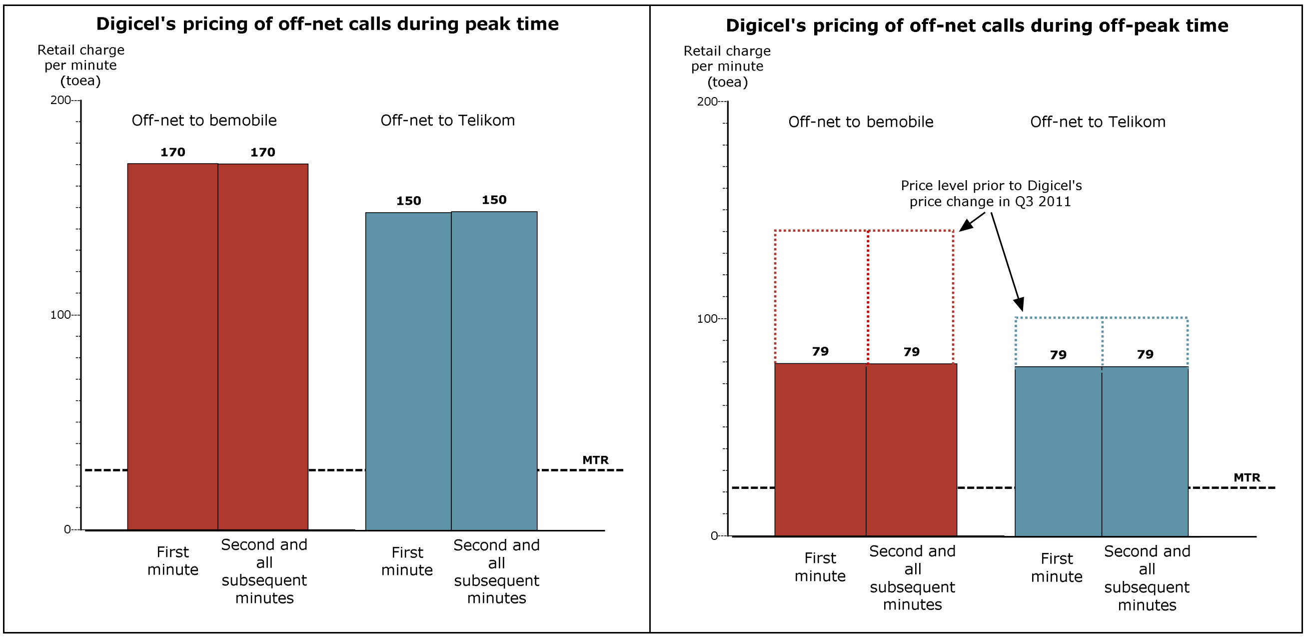




6.4.3.2 Discrimination between terminating networks

Digicel's pricing for on-net calls during peak times also discriminates between calls that terminate on bemobile's network and calls that terminate on Telikom's network. This is shown in Figure 11. As shown in that figure, similarly discriminatory pricing applied to off-net calls made during off-peak times prior the price changes that Digicel introduced in Q3 2011. Once again, there is no evidence that any of these price differences reflect any differences in the actual costs incurred by Digicel in terminating off-net calls on those two particular networks.

Figure 11: Digicel's price discrimination between prepaid off-net calls



6.4.3.3 The magnitude of the price discrimination between on-net / off-net calls

NICTA staff's analysis of the size of the differences between the prices that Digicel charges for on-net and off-net calls found that the magnitude of the price discrimination to be excessively high. A large differential between on-net and off-net prices can be an indication of an anti-competitive pricing strategy[191] and there is no evidence that suggests that the price differences are in any way influenced by differences in costs.

Digicel's prices and price differentials for on-net and off-net calls are summarised in Figure 12. The price structure discussed in section 6.4.3.1 creates a considerable difference between the price of a second (and each subsequent) on-net minute, and the price of a second (and each subsequent) off-net minute. This is reflected in the off-

[191] Hoernig, S. (2007) op.cit. p.17. Ofcom has also noted that it is the size of the difference between on-net and off-net prices that is the key to the problem; refer Ofcom (2011) op.cit.

net price premium,[192] which is high for the first minute of a call (72% during peak times) and extremely high for the second and all subsequent minutes of a call (1,445% during peak times). This is evident from a comparison of Figure 13 and Figure 14. The combination of a substantial decrease (of 89%) after the first minute in the per minute (peak time) on-net call price, and a fixed per minute charge for the duration of off-net calls, means that the off-net price premium increases the longer the duration of a call. This can be seen in Figure 15, Figure 16 and Figure 17. Thus Digicel's off-net calls become more expensive compared to an on-net call the longer the call lasts.

Figure 12: Digicel's on-net / off-net call prices, price differentials and price premiums (March 2012)

Type of call minute		On-net price (toea)	Off-net price* (toea)	Difference (toea)	Ratio	Off-net price premium
First minute	Peak	99	170	71	1:1.7	72%
	Off-peak	49	79	30	1:1.6	61%
Second and all subsequent minutes	Peak	11	170	159	1:15.5	1,445%
	Off-peak	11	79	68	1:7.2	618%
Average price per minute for a two minute call	Peak	55	170	115	1:3.1	209%
	Off-peak	30	79	49	1:2.6	163%
Average price per minute for a five minute call	Peak	29	170	141	1:5.9	486%
	Off-peak	19	79	60	1:4.3	316%
Average price per minute for a ten minute call	Peak	20	170	150	1:8.6	750%
	Off-peak	15	79	64	1:5.3	427%

* All peak-time off-net prices are prices for peak-time off-net calls to bemobile

[192] Price premium refers to the additional price at which one product is offered in a market compared to a similar (or comparator) product. The term is used as a neutral descriptive term in this context.

Figure 13: On-net and off-net prices for the first minute of a prepaid call

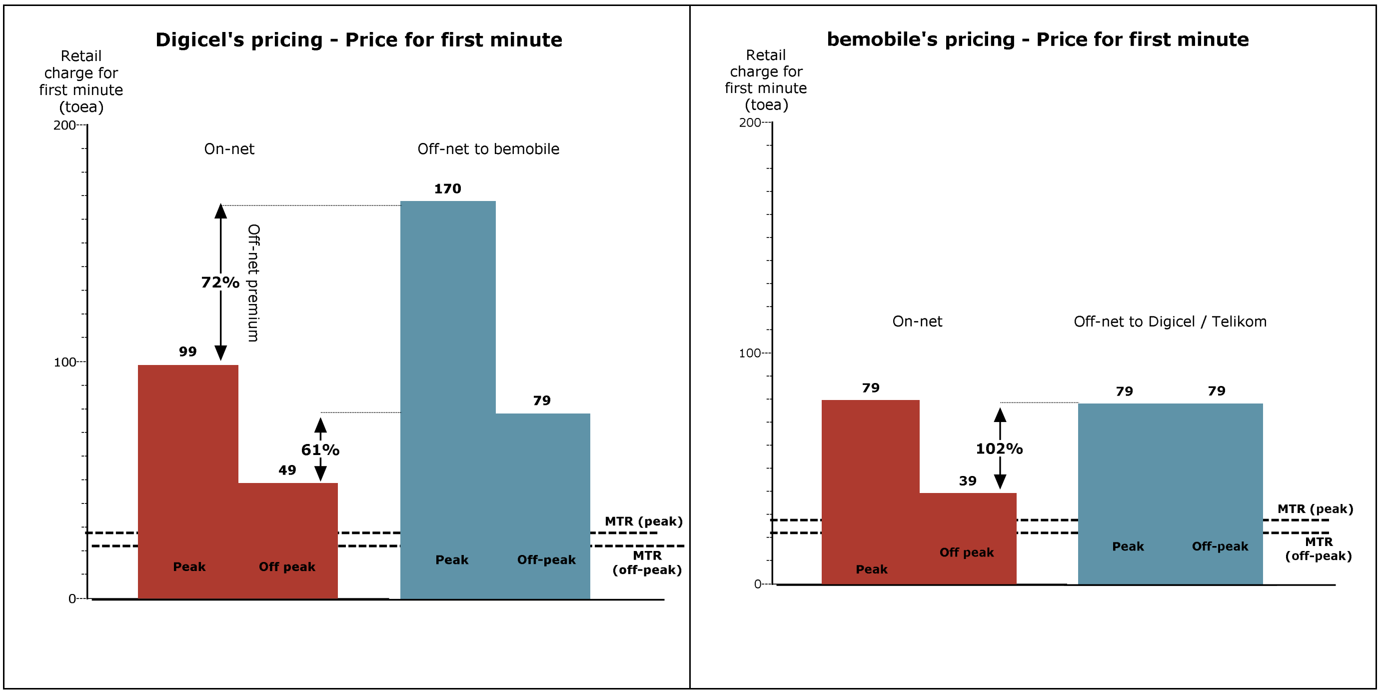


Figure 14: On-net and off-net prices for the second and each subsequent minute of a prepaid call

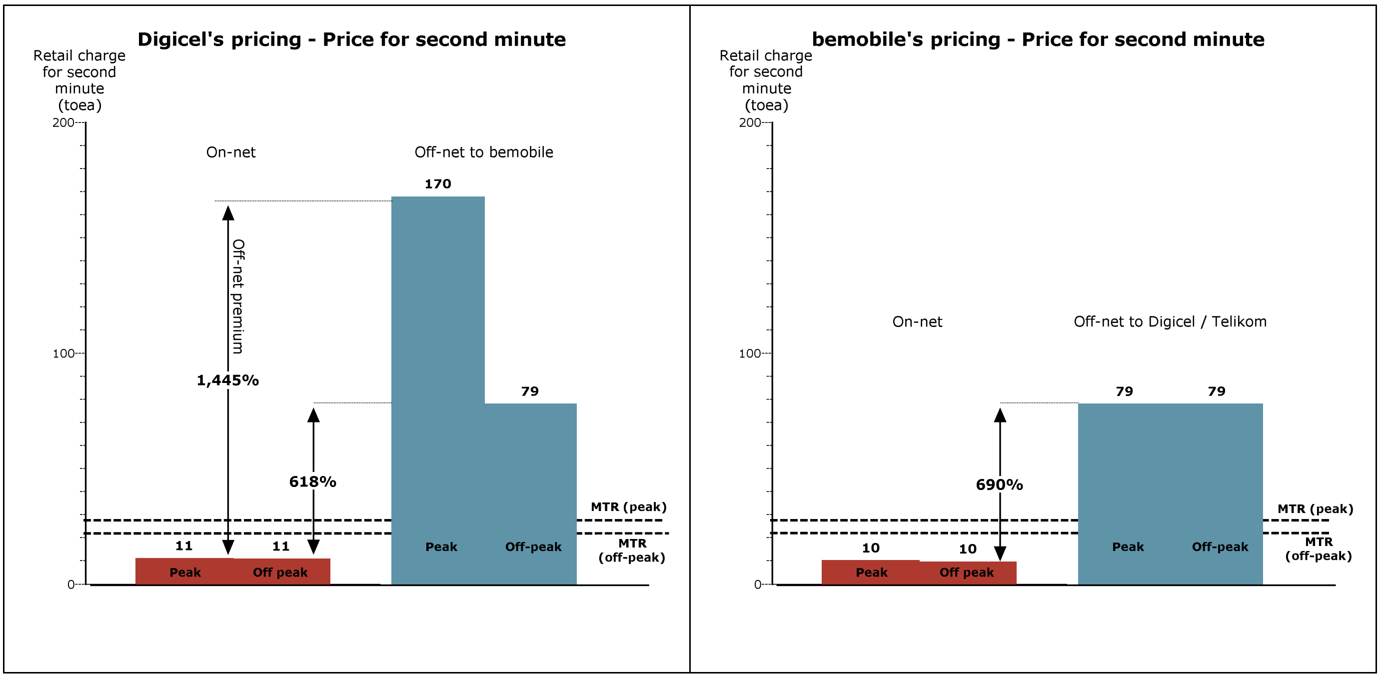


Figure 15: Average on-net and off-net prices for a prepaid call of two minutes' duration

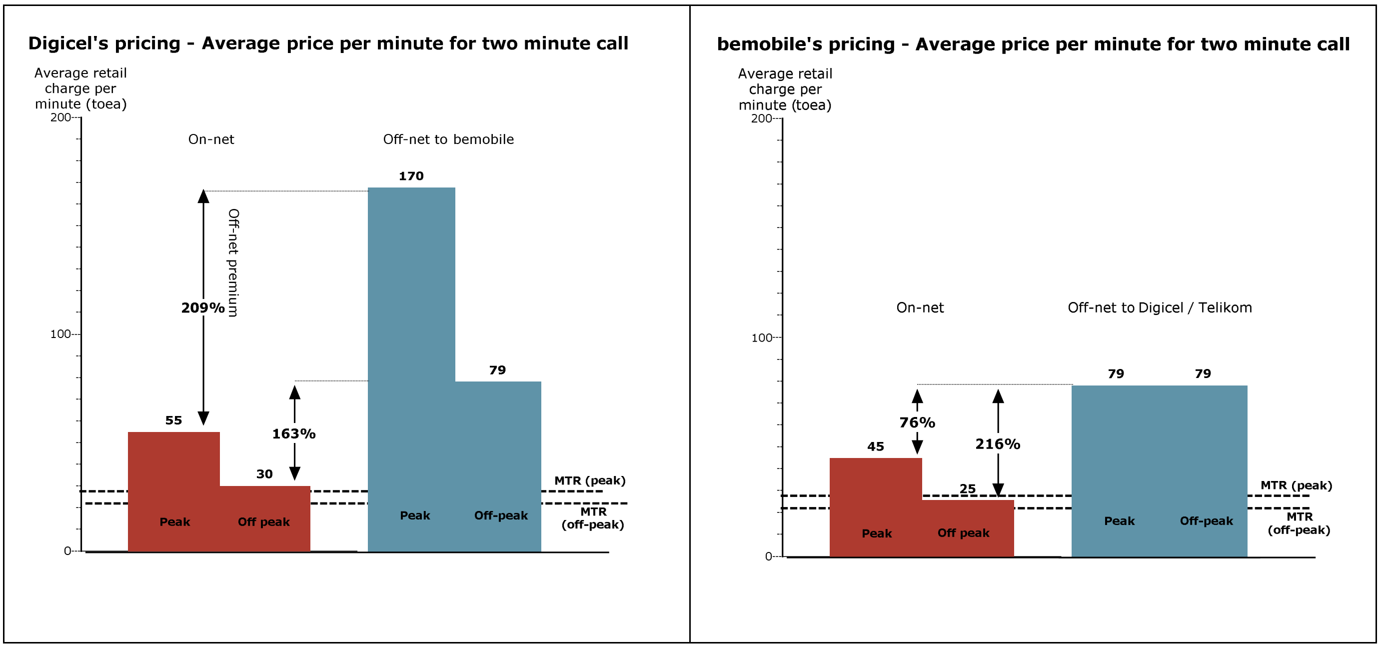


Figure 16: Average on-net and off-net prices for a prepaid call of five minutes' duration

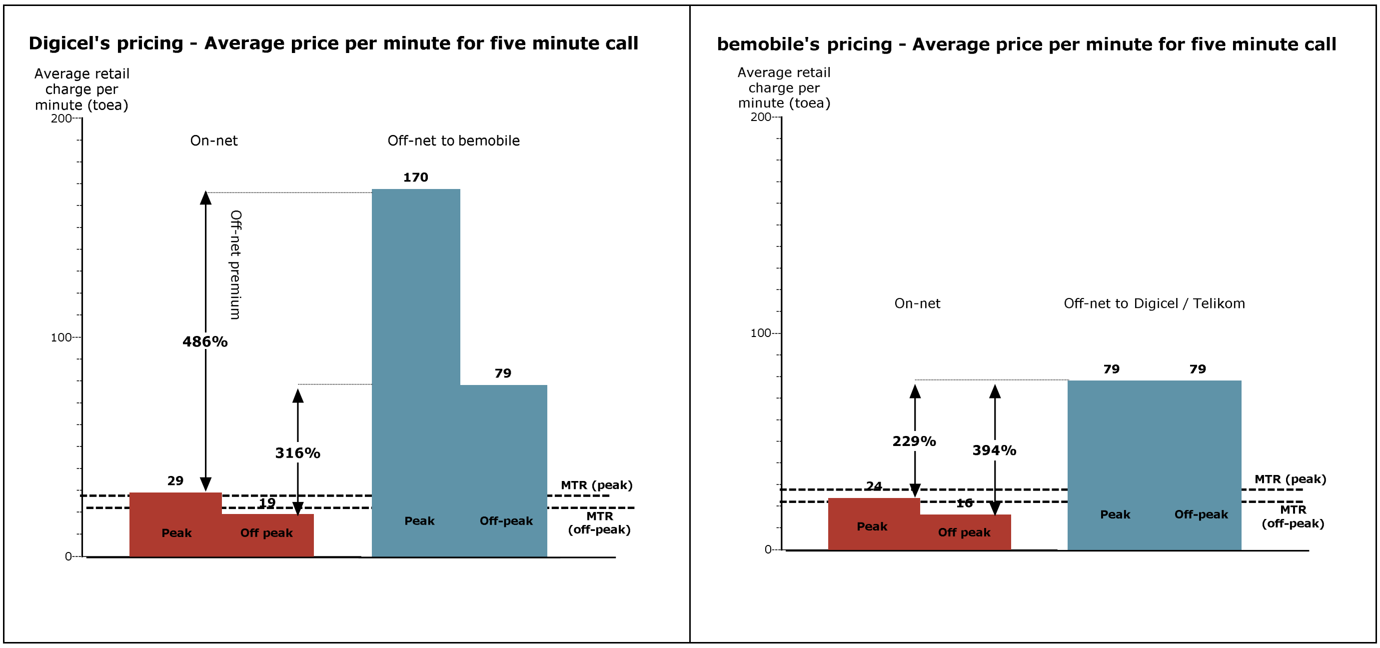
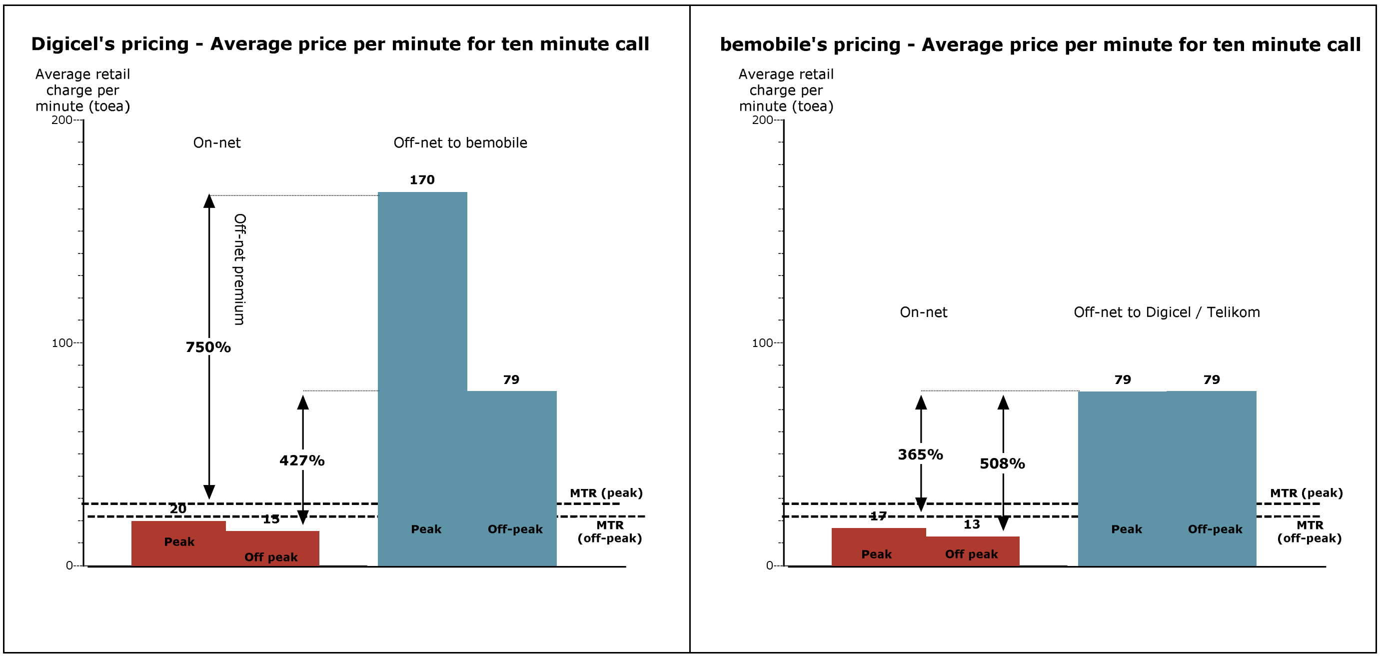


Figure 17: Average on-net and off-net prices for a prepaid call of ten minutes' duration



The size of Digicel's off-net price premiums, and Digicel's off-net prices as a percentage of the MTR, are both very high by international standards. This is highlighted by Figure 18, which compares Digicel's off-net prices and off-net price premiums with those that applied (before regulatory intervention) in four countries that found the on-net/off-net price discrimination by MNOs with SMP were at levels that were anti-competitive.[193]

[193] Only four comparison countries are shown in Figure 18 because NICTA staff did not have access to relevant pricing information from the correct time period for the other countries identified in this discussion paper that have acted to address anti-competitive price discrimination between on-net and off-net calls.

Figure 18: Comparison of Digicel's (peak time) off-net prices and differentials with those in selected countries that have regulated on-net/off-net price discrimination

Country	Largest MNO	Market share	Off-net price premium	Off-net price as a percentage of the MTR	Year
PNG	Digicel	75% (subscribers) 88% (revenues)	First minute: 72% Subsequent minutes: 1,445% Two minute average: 209% Five minute average: 486% Ten minute average: 750%	654% (off-net to bemobile) 577% (off-net to Telikom)	2012
Kenya[194]	Safricom	81% (subscribers)	88%[195]	339%	2010
Namibia[196]	MTC	76% (subscribers)	Ranging from 20%–236% depending on the particular product	Ranging from 330%–833% depending on the particular product	2011
Qatar[197]	Qtel	75% (subscribers) 80% (revenues)	Ranging from 60%–80% depending on the particular product[198]	not available	2011
Turkey[199]	Turkcell	58% (subscribers)	Ranging from 47%–123% depending on the particular product	Ranging from 384%–462% depending on the particular product	2006

NICTA staff also sought to understand whether or not Digicel's off-net price premiums were high relative to those that currently exist in other comparable countries. As Digicel indicated in its cross-submission that price discrimination is 'fundamental to Digicel's strategy',[200] NICTA decided to look at how Digicel's off-net pricing in PNG compares with the off-net pricing of other MNOs within the Digicel Group, which generally operate in small developing countries that each have two or three competing MNOs and where on-net/off net price discrimination is not regulated. In order to establish a context, NICTA staff also looked at the off-net pricing of the other main MNO in each market.

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[194] Communications Commission of Kenya (CCK) (2010b) *Quarterly Sector Statistics Report 4th quarter Apr-Jun 2009/2010*, p.5. available at www.cck.go.ke/resc/downloads/Sector_Statistics_Report_Q4_09010.pdf

[195] Based on Safaricom's Ongea tariff as at 5 April 2010.

[196] Namibia Communications Commission (2011) op.cit. p.5

[197] ictQATAR (2011) op.cit.

[198] Based on correspondence with ictQATAR

[199] Atiyas, I. and Doğan, P. (2007) 'When Good Intentions Are Not Enough: Sequential Entry and Competition in the Turkish Mobile Industry,' *Telecommunications Policy* 31(8-9), 502-523, available at https://research.sabanciuniv.edu/4797/2/Atiyas_dogan_Tr_mobile.pdf.

[200] Digicel (2012), op.cit. paragraph 36

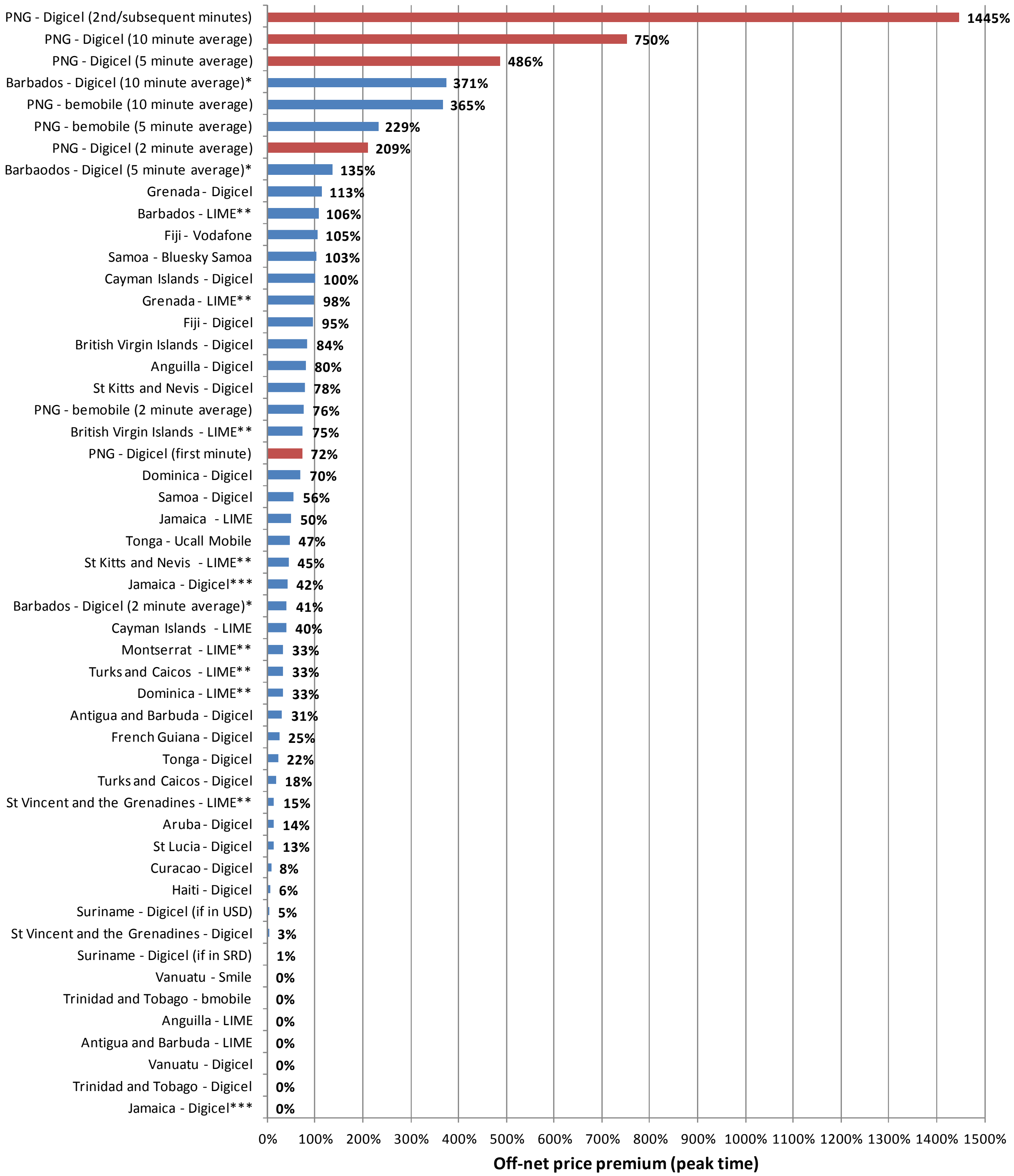
That comparison indicates that Digicel's on-net/off-net price discrimination in PNG is excessive by comparison to those other mobile markets. Although the off-net price premium charged by Digicel (PNG) for the first minute of a call is towards the high end of this sample, it is not as high as that seen in Anguilla, the Cayman Islands or Fiji for example. However, the off-net price premium that Digicel charges for the second and each subsequent minute of a call, and the per minute average off-net price premium, are extremely high. See Figure 19.

Note that in all of the countries in Figure 19 with the exception of Barbados, MNOs charge the same price per minute for each minute of the call, unlike PNG where a different price is charged for the first minute compared to the second and subsequent minutes. Accordingly, in those countries, the off-net price premium does not change over the duration of the call. Therefore, to allow proper comparison, average per minute prices for calls of different durations are shown for PNG and Barbados.

The results from PNG and Barbados in Figure 19 suggest that effective two-part tariffs (such as the application of different rates for the first and subsequent minutes) can tend to produce higher off-net price premiums. However, Digicel's average per minute off-net price premium for a 10 minute call in PNG is still double that of an equivalent call in Barbados. Given that Digicel (Barbados)'s on-net calls in Barbados are free of charge after the first three minutes, such a result further demonstrates that Digicel (PNG)'s off-net price premium is very high.

Figure 20 compares off-net prices (during peak times) as a proportion of the applicable MTR in those countries in Figure 19 for which MTR data was publicly available and again shows that Digicel's off-net prices in PNG are very high in comparison.

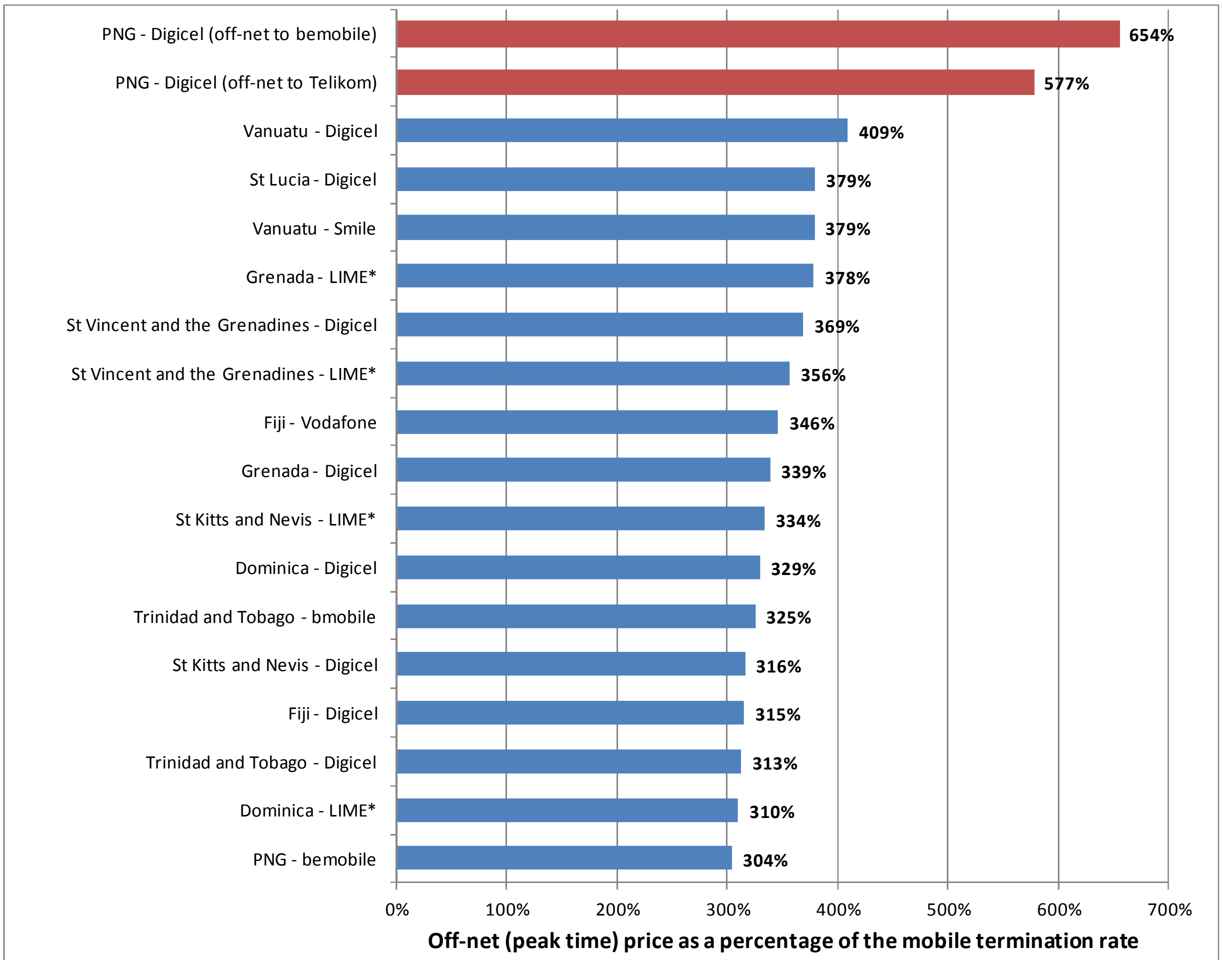
Figure 19: International comparison of off-net price premiums



* In Barbados on-net calls are free after the third minute so per minute averages have been shown for comparison consistency
**LIME offers prepaid plans in these countries so the only per minute prices available are those for out of plan minutes
***In Jamaica, on 2/3/12 Digicel introduced a new opt-in 'one rate option' that does not discriminate between on-net/off-net

Source: operators' websites. Current as of March 2012

Figure 20: International comparison of off-net prices as a percentage of the applicable MTR



* LIME offers prepiad plans in these countries so the only per minute prices available are those for out of plan minutes

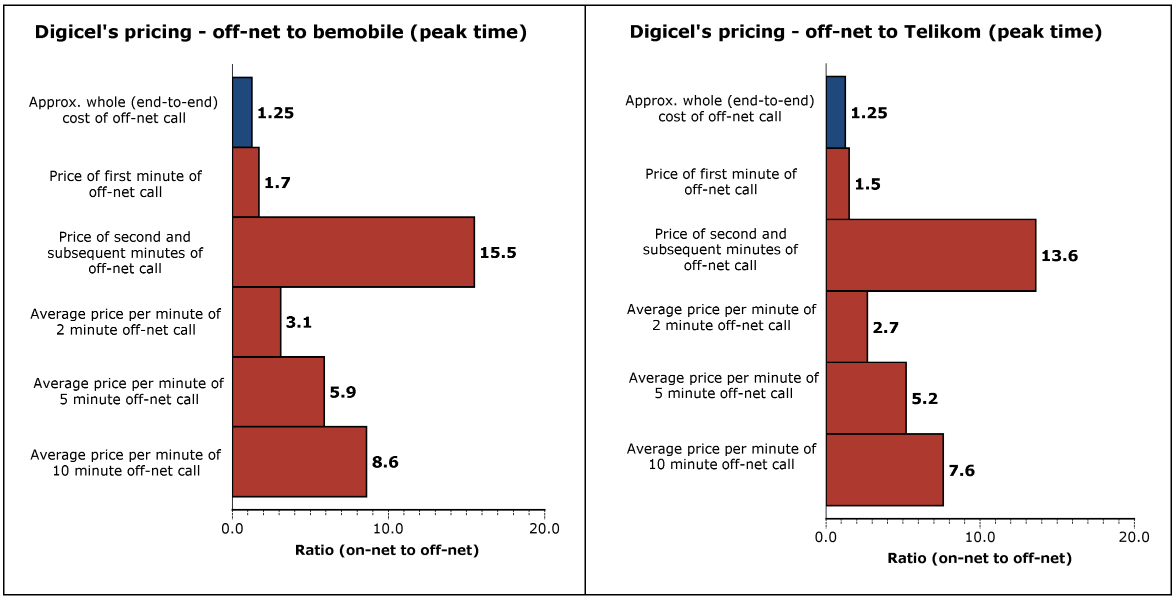
Source: operators' and regulators' websites. Prices current as of March 2012

6.4.3.4 Price discrimination not based on differences in costs

Digicel's on-net/off-net price discrimination does not appear to be justified by any differences in underlying costs. The cost of a mobile call comprises the costs of origination, termination and any transit in between. Generally speaking, the costs of termination on efficient networks should be approximately the same whether carried end-to-end on one operator's network or over two or more interconnected networks, after allowance for incremental costs associated with the conveyance of a call to a point of interconnection (POI) and the costs associated with operating that POI. Those costs have been modelled for many mobile networks in many countries and that cumulative experience suggests that an allowance of 50% on off-net termination compared to on-net termination would be more than adequate to account for the incremental costs referred to in a situation where the POI and interconnection links are appropriately dimensioned to the traffic levels carried. On this basis the ratio of the cost of an on-net call to the cost of an off-net call would be 1:1.25.

On this basis Digicel's discriminatory price structure and off-net prices are excessive and go well beyond reflecting any likely differences in the underlying costs associated with off-net calls. This can be seen in Figure 21, which compares the approximate difference between the cost of an on-net and the cost of an off-net call (estimated to be a ratio of 1:1.25) with the differences in the per minute retail prices currently charged by Digicel for off-net calls.[201] (N.B. the quantities shown in Figure 21 are price ratios, not prices.) The differences between Digicel's prices for on-net and off-net calls are substantially greater than the estimated difference in the costs of on-net and off-net calls. In the case of the per minute price for the second and each subsequent minute of a call, the difference is extremely great and leads to the differences in the average price per minute for calls for various durations also being excessively high.

Figure 21: Comparison of the likely differences in on-net/off-net call costs with the differences in Digicel's on-net/off-net call pricing



Note: The quantities shown in Figure 21 are price ratios, not prices.

201 NICTA staff note that this sort of approach is consistent with that adopted in other jurisdictions. For example, in Bahrain where on-net/off-net price discrimination currently exists but at levels that are not considered to have anti-competitive consequences, the Telecommunications Regulatory Authority's (TRA's) Competition Guidelines state that 'In assessing whether on-net / off-net pricing differentials constitute anti-competitive conduct...TRA will take into account the difference between the termination rate of other operators and the cost of terminating calls on-net. A differential between off-net and on-net call rates that is significantly greater than the differential between the termination rate and the cost of terminating calls on-net could be indicative of a potential abuse of a dominant position, as the price differences would not be justified purely on the basis of costs.' See TRA Bahrain, Competition Guidelines, p.57–58, available at www.tra.org.bh/en/position.asp

6.4.3.5 Digicel's discriminatory prices cannot be matched by its competitors

In many jurisdictions, the concerns about the potential consequences of price discrimination between on-net and off-net calls are exacerbated by high (that is, above cost) termination rates. The Body of European Regulators of Electronic Communications has described the concern thus:

> 'The problem of price discrimination to foreclose the market pertains mainly to the M2M [mobile to mobile calls] situation. The incumbent operator(s) may seek to foreclose the retail market by charging a high (above-cost) termination charge to other networks whereas implicitly charging a lower price internally. This leads to high costs for off-net calls for other operators at the wholesale level and thus to high prices for off-net calls at the retail level. On-net calls, on the other hand, are associated with lower costs and thus with lower retail prices. Such a price structure creates network externalities ('tariff mediated network externalities') and thus puts small networks with few participants at a disadvantage. The disadvantage is larger the higher the termination charge and thus the higher the difference between the price of an on-net and an off-net call is.'[202]

The principal concern here is that the combination of on-net/off-net price discrimination by a mobile network operator with SMP and high mobile termination rates can impose an effective margin squeeze on smaller networks. This is because above-cost termination prices provide room for the operator with SMP to price its on-net calls below the termination rate. As the other network operators must pay the price of call termination for each off-net call that terminates on the SMP operator's network, they cannot match the SMP operator's on-net pricing without making a loss. As the European Commission explains:

> 'As smaller networks typically have a large proportion of off-net calls, this leads to significant payments to their larger competitors and hampers their ability to compete with on-net/off-net retail offers of larger incumbents. This can reinforce the network effects of larger networks and increase barriers to smaller operators entering and expanding within markets.'[203]

NICTA staff examined whether bemobile and Telikom could mitigate the effects of Digicel's on-net/off-net price discrimination by setting their off-net call prices at levels that match Digicel's (current) on-net call rates. That is, replicating the prices that Digicel charges for on-net calls in order to mitigate the club effect. If the off-net pricing of the non-SMP operators could be set equal to the on-net pricing of the SMP operator without incurring losses, then the competition concerns about the effects of Digicel's

[202] BEREC (2006), op.cit. p.36

[203] European Commission (2009a) op.cit. page 16

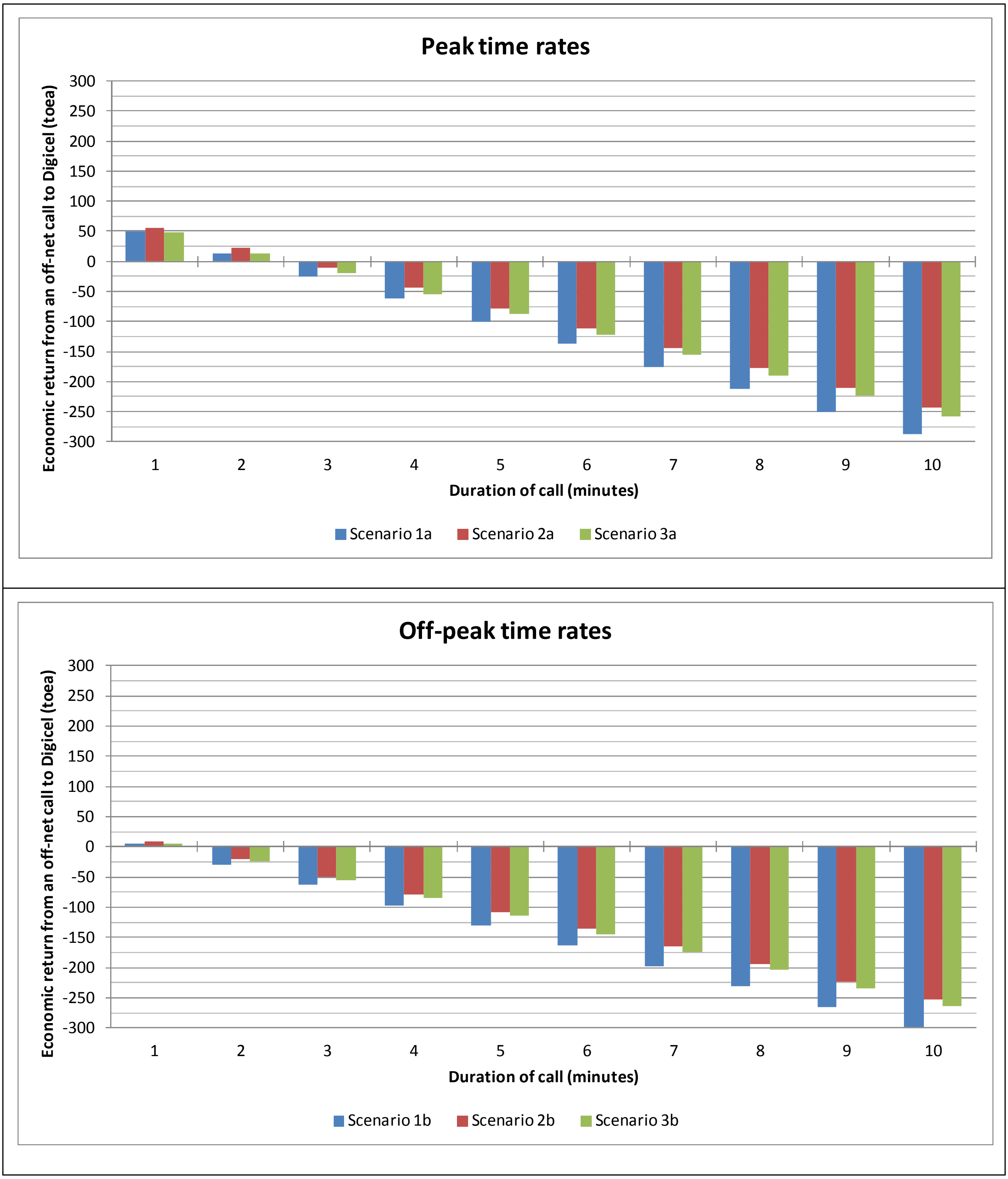
on-net/off-net price discrimination would be significantly reduced because the non-SMP operators would have the ability to compete.

NICTA staff considered three scenarios, as defined in Figure 22, in which non-SMP operators set their off-net call prices at the same level as Digicel's (current) on-net call prices for both peak and off-peak times. The scenarios are intended to cover a wide range of circumstances given the information available on costs. The results, shown in Figure 23 indicate that the adoption of a price-matching strategy by a non-SMP operator would only provide a profit during peak times if the call lasted two minutes or less. During off-peak times, it would only provide a profit if the call lasted one minute or less. In all other instances, the price matching strategy would be loss-making for a non-SMP operator. Accordingly, NICTA staff concluded that bemobile and Telikom could not match Digicel's on-net prices without incurring significant losses that would need to be subsidised through higher on-net or other prices, particularly given that a significant proportion of the traffic originated by the non-SMP operators' terminates off-net.

Figure 22: On-net price-matching strategy scenarios

SCENARIO TITLE			**SCENARIO DESCRIPTION**
	Peak	**Off-peak**	
Scenario 1	a	b	Assumes the current MTR reflects the actual wholesale cost and the non-SMP operators' retail costs are made up of the MTR, their own network costs (67% of MTR, consistent with rationale in section 6.4.3.4) and a retail cost mark-up of 30% on their own network costs.
Scenario 2	a	b	As per Scenario 1 but also assumes current MTR is 25% above the actual wholesale cost and therefore that the non-SMP operators' costs are lower but the full MTR must still be paid.
Scenario 3	a	b	As per Scenario 2 but also assumes that Digicel is able to command a retail price premium of 7.5% compared to its competitors.

Figure 23: Results of on-net price matching strategy scenarios



Significantly, the above consideration of the viability of a price-matching strategy adopted by one of Digicel's competitors is based on the prices that Digicel *currently* charges for on-net calls. Under the scenarios, Digicel would need only to reduce to 77 toea (from 99 toea) the price of the first minute for peak time on-net calls in order to make a competitor's price-matching strategy even more unprofitable as doing so would render uneconomic all but a one minute off-net call (to Digicel). If Digicel reduced the price of that same first minute to 44 toea, all peak time off-net calls of all durations would be unprofitable under all three of the scenarios considered. If Digicel reduced the price of the first minute of its off-peak on-net call rate to 40 toea (from 49 toea), all off-peak off-net calls (to Digicel) of all durations would be unprofitable.

In conclusion, even though bemobile and Telikom may be able to achieve a profit on calls of very short duration if they set their off-net call prices at a level that matched the price charged by Digicel for on-net calls, doing so would not enable them to compete effectively with Digicel because:

(a) bemobile and Telikom could not steer their customers away from making the unprofitable longer off-net calls except through higher pricing of such calls, which would negate the entire strategy that has been described and tested above;
(b) Even without detailed information on the spread of the duration of calls, it is apparent that large losses from longer calls will need to be subsidised from the fragile profits from shorter (sub-2 minute) calls; and
(c) The profits of shorter (sub-2 minute) calls would be fragile, because they are entirely dependent on Digicel not responding by reducing the price of the first minute of an on-net call on its network. There is no reason to assume that Digicel would not be pro-active in promoting its competitive interests by price changes as required.

6.4.3.6 Price discrimination is distorting traffic flows

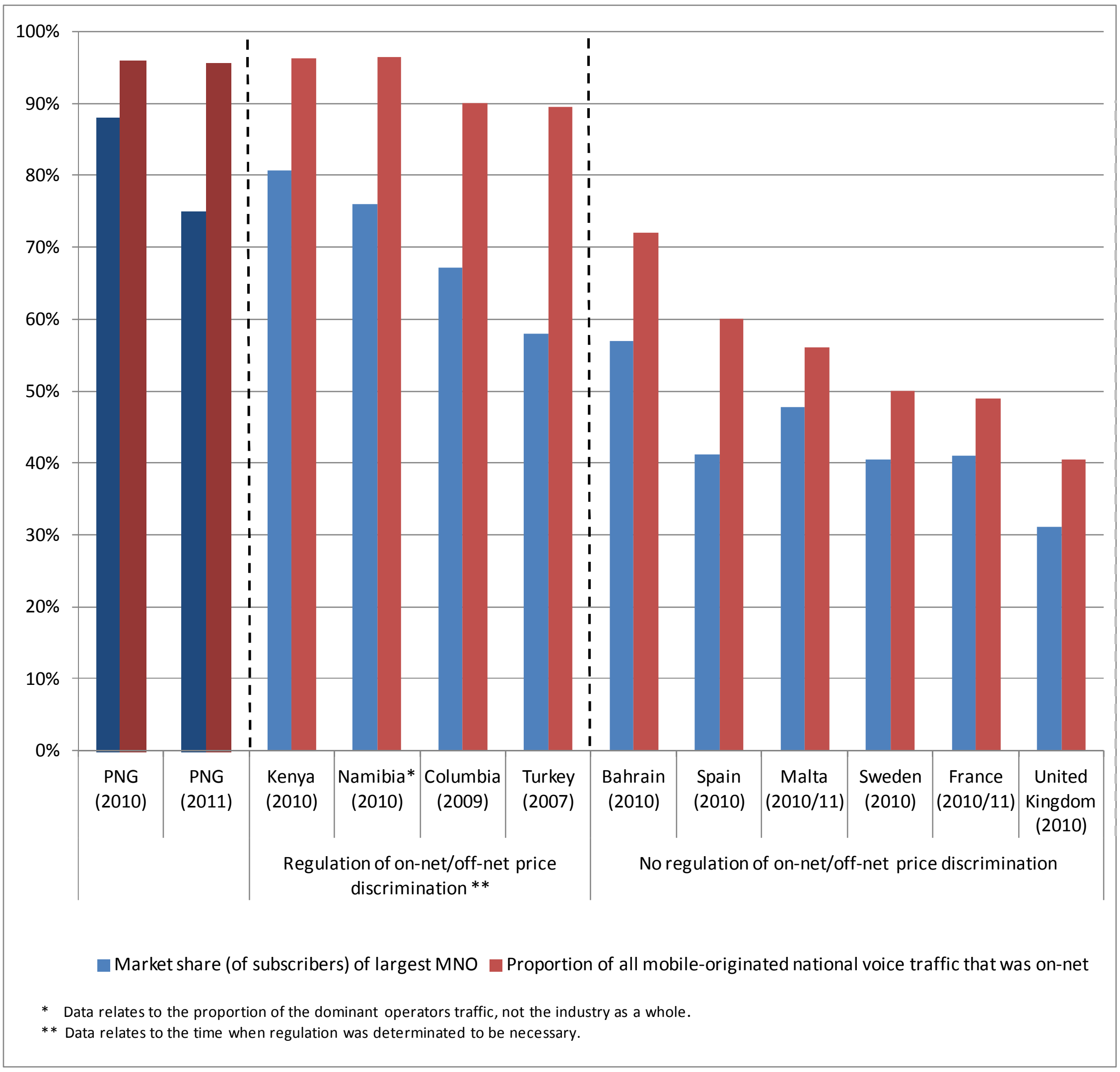
The strength of the club effects being generated by on-net/off-net price discrimination can be seen in the extremely high proportion of mobile-originated traffic that is terminating on-net. In PNG, on-net traffic accounts for over 95% of all mobile-originated national voice traffic. Only about 3% of mobile-originated national calls terminate off-net (the remainder terminates on the fixed network). This is a very high proportion of on-net traffic and has remained virtually unchanged for the last two years. By way of comparison, if subscribers were distributed randomly across mobile networks and the probability of a call to a particular person was independent of that person's choice of network, then on-net traffic in PNG would account for 58.9% of all mobile originated traffic.[204]

[204] This is based on existing subscriber shares of each MNO and using those share shares to get a weighted average.

As shown in Figure 24, the 95% figure is similar to the high proportions of on-net traffic that existed in a number of other countries at the time the relevant National Regulatory Authority (NRA) considered that regulatory intervention was necessary to address anti-competitive on-net/off-net price discrimination. Further, as also shown in that figure, the proportion of on-net traffic in PNG is also very high by comparison to a sample[205] of other countries where on-net/off-net price discrimination is not regulated, suggesting that the current on-net/off-net pricing practices in PNG may be distorting the distribution of traffic.

[205] The sample size is limited by the number of countries for which the relevant data is available.

Figure 24: International comparison of total on-net mobile traffic relative to market share[206]



[206] Data sources—Kenya: Communications Commission of Kenya (2010b) *op.cit.* pp.5,8; Namibia: NCC (2011) op.cit. p.9; Columbia: Telecommunications Management Group (TMG) (2011) *On-net/off-net price differentiation: Review of international precedent*, p.5, available at www.comcom.govt.nz/assets/Telecommunications/STD/MTAS/Submissions-on-draft-MTAS-STD/Telecommunications-Management-Group-Report-for-2degrees-submission-on-draft-MTAS-STD-On-net-Off-net-Differentiation-Review-of-International-Precedent-7-February-2011.PDF; Bahrain: Telecommunications Regulatory Authority of Bahrain (2012), *Telecommunications markets indicators in the Kingdom of Bahrain*, January 2012, p.19, available at www.tra.org.bh/en/pdf/2011TelecommunicationsMarketsIndicators-ForPublic.pdf; Spain: CMT (2010) *Annual Report*, available at http://informeanual.cmt.es/informe-sector/comunicaciones-moviles; Malta: Malta Communications Authority (MCA) (2011) *Communications Market Review: July to December 2010* (MCA/O/11-0312) pp.10, 21 available at www.mca.org.mt/sites/default/files/articles/CMR_SH_2010_-_REPORT(1).pdf; Sweden: Swedish Post and Telecom Authority (PTS) (2011) *The Swedish Telecommunications Market 2010*, Table 17, available at www.statistik.pts.se/pts2010e/index.html; France: Arcep (2011), *Quarterly observatory of the electronic communications market in France - 2nd Quarter 2011*, available at www.arcep.fr/index.php?id=11054&L=1#c19728; UK: Ofcom (2011) *Communications Market Report: UK*, pp.290,292, available at http://stakeholders.ofcom.org.uk/binaries/research/cmr/cmr11/UK_CMR_2011_FINAL.pdf

Figure 24 shows the appropriateness of taking regulatory action when the proportion of market traffic that is on-net is very high (typically around 90% or over) accompanied by a high subscriber market share by the largest operator (typically around 70% or more). Importantly, the former (the proportion of on-net traffic) is greater than latter (the market share). This is to be expected, because if the share of on-net traffic for the market as a whole was close to or less than the subscriber market share of the largest operator, it would suggest that any price discrimination strategy adopted by that operator was poorly conceived or poorly executed. NICTA staff do not consider that it is appropriate to concentrate on the difference between the two percentage figures (i.e. on-net traffic and market share by subscriber) because there are limits within a maximum percentage of 100% on how far either figure can go. In the case of PNG, there is little room for further growth in on-net traffic given that in 2011 it represented 95.5% of all mobile-originated national voice calls.

It is reasonable to expect that an MNO with the greater share of subscribers and greater network coverage will have a commensurately high proportion of traffic that remains on-net. However, the proportion of Digicel's national voice traffic that remained on-net is exceptionally high. In 2011, 98.51% of all national voice traffic that originated on Digicel's network was terminated on-net. This is virtually the same as the year before (98.46%). Such a high proportion of on-net traffic is very close to the connectivity breakdown that is theorised in the academic literature.[207] It is also suggestive of the type of anti-competitive strategic behaviour identified by Harbord and Pagnozzi (2010), whereby a larger network operator reduces the traffic to, and thus termination revenue earned by, smaller network operators. bemobile identified its concern about this matter in its submission to the first discussion paper.[208] Referring to comments made by Ofcom about end-to-end connectivity (in the context of a wholesale call termination market analysis), bemobile said:

> 'While Ofcom discusses the importance of end-to-end connectivity in the context of a strategic refusal by a large mobile network to allow its customers to call customers on the small network, the harm identified by Ofcom can equally be caused by tariff based refusal – i.e. setting off-net call prices so high that calls to smaller networks are virtually eliminated as is the case in PNG today. This strategic pricing behaviour has the same competition effect as a refusal to interconnect, which would clearly not be accepted by any regulatory authority.'[209]

[207] Jeon, et.al. (2004), op.cit.; Katz, M. and Shapiro, C. (1985) 'Network Externalities, Competition, and Compatibility', *American Economic Review*, Vol.75, pp. 424–440; Cremer, J., Rey, P., and Tirole, J. (2000) 'Connectivity in the Commercial Internet', *Journal of Industrial Economics*, Vol.48, pp. 433–472.

[208] bemobile (2011a), op.cit. pp.18–19

[209] bemobile (2011a), op.cit. paragraph 9.12 on p.26

This is an interesting analogy and NICTA staff are inclined to agree. Just as a refusal or discontinuation of interconnection would not be tolerated, a mobile traffic distribution that is almost 100% on-net is also undesirable.

6.4.3.7 Consideration of alterative views and interpretations

NICTA staff considered alterative views and findings in the academic literature, other possible interpretations of Digicel's current pricing structures, and generally looked for evidence that showed that Digicel's on-net/off net price discrimination is not having or risking the anti-competitive effects discussed above. NICTA staff did not find any of these possible counter-arguments to be compelling, either individually or in aggregate. Some were found to be incorrect, such as the suggestion that the current differentiated pricing reflects differences in the underlying costs. Others were not supported by the data on the PNG market, such as the suggestion that the on-net/off-net price discrimination in PNG is no different from that practised in other countries, or the suggestion that it reflects a market that is intensely competitive.

An overview of some of the possible counter-arguments that NICTA staff gave particular attention to, together with NICTA staff's conclusions on the merits and applicability of each of the arguments, is provided below:

(a) On-net/off-net price discrimination has been a feature of mobile markets for many years and remains so in many countries—This is true, but it is important to distinguish between the situation of operators with SMP and of those in a competitive market. It is also important to distinguish between differences that are justified by cost or other factors and differences that are not so justified.

(b) Club effects can work on smaller networks—This is true, but it is the anti-competitive effects that arise from the club effects of a large network with SMP that is the issue in the present inquiry.

(c) Tariff mediated network externalities make customers more profitable and therefore more attractive to network operators, giving all network operators an incentive to compete strongly to increase their market share, which in turn intensifies competition and ultimately increases consumer surplus—This argument ignores the reduced ability of the smaller network subject to the debilitating effects of price discrimination and margin squeeze to compete for attractive customers or indeed for any customers.

(d) Price discrimination can be welfare enhancing as it enables a network operator to recover more of its fixed and/or common costs from those customers who value the service most highly and thus have a higher willingness to pay for it. This in turn enables the network operator to reduce the prices to those customers whose demand is more price sensitive, thereby leading potentially to a higher level of overall demand and consumer welfare—This is correct but concerns price discrimination generally, not in the specific situation outlined in this market. Nor does it address the specific issues that arise when price discrimination is a tool to maintain and extend SMP in a market.

(e) On-net/off-net price discrimination reflects product innovation which benefits and is demanded by customers—There is no evidence of innovation in the practices that are being considered. NICTA staff have found no evidence of a demand by subscribers to pay more to call subscribers on other networks.

(f) There may be differences in the marginal costs between on-net and off-net calls—If there are differences in the marginal costs of on-net and off-net calls no evidence has been offered to date.

(g) As smaller network operators have fewer on-net customers, they are able to compete more vigorously on on-net pricing when compared to their larger rivals because they face lower financial risks from lower on-net prices compared to their larger competitors who have more to lose from matching the prices for on-net calls offered by smaller rivals—The cost of discounting on-net prices will be lower with fewer subscribers, but the benefit of doing so will be less effective as well. It is important though to recognise that the subject matter of this inquiry is not the discounting of on-net prices but the effect of price discrimination in relation to off-net call prices. The matters should not be conflated as if they were one and the same, because they are not. A smaller network is unable to follow suit and increase its off-net calling prices because it does not have an off-setting benefit for its subscribers in terms of on-net offers. As noted earlier, on-net benefits are smaller with small networks.

(h) Larger networks may charge higher on-net prices without anti-competitive intent[210]—This may be the case, but it is not the issue that is under examination and need not be pursued. The corollary – that larger networks may charge lower on-net prices without anti-competitive intent – may also be the case. The circumstances and extent of the charging practice are important contextual factors in determining how to characterise the pricing behaviour

(i) Even in the absence of on-net/off-net price discrimination, on-net traffic can be disproportionately high[211]—High on-net calling levels may exist for many reasons. However they may well be the result of excessive price discrimination between on-net and off-net calls. Identifying high on-net call levels clearly is part of the overall context that needs to be understood. If there was a relatively low level of on-net calling in a market this would suggest that any price discrimination strategy was not working. It is therefore important to establish that the levels of on-net calling are indeed high.

NICTA staff accept that there may be some consumer demand for discounting of on-net call prices (indeed, any call prices) however, analysis and comparison of Digicel's

[210] Hoernig (2007) op.cit.

[211] Birke and Swann (2006) op.cit.

pricing suggests that Digicel's pricing structure reflects a marking-up of off-net prices that is greater than any discounting of on-net prices. It is important to recognise that the issue in this inquiry is not on-net price discounting, but price discrimination through high charges for off-net calls. These are not simply two sides of the same coin. The effects of price discrimination may be exacerbated by also discounting on-net calls, but such discounting is not necessary for the price discrimination to exist or to be effective. In any case, NICTA staff consider that any price discounting in the short term cannot outweigh the risk of ineffective competition in the longer term and the resultant potential for higher prices (for all types of calls) to be entrenched in the long term. NICTA staff also accept that on-net/off-net price discrimination may occur without anti-competitive intent. However, given the highly discriminatory price structure employed by Digicel, the magnitude of the differences between Digicel's on-net and off-net call prices, and the absence of any cost-related basis for the discrimination, that does not appear to be the case here.

6.5 Proposed conclusion

NICTA staff conclude that Digicel's SMP in the retail mobile services market gives it the incentive and the ability to price discriminate between on-net and off-net mobile calls in a manner that is anti-competitive because it increases barriers to entry and/or expansion and customer lock-in and, in turn, risks leading to the foreclosure of the market to competition.

The factors that NICTA staff found most compelling in reaching this conclusion were:

- Digicel's SMP in the retail mobile services market and in particular its substantially larger market shares compared to its competitors (shown in Figure 3 on page 31);
- Digicel's highly discriminatory price structure and the extent of its discrimination between its on-net and off-net prices; and
- the extremely high proportion of Digicel's national traffic that remains on-net.

NICTA staff note that these same three factors were also found to be relevant indicators of a significant competition problem in other countries that have examined similar practices, including the ex post investigation of on-net/off-net price discrimination in the French overseas regions by the French competition regulator (summarised in section 6.4.2).

Specific questions for stakeholders

Question 10: If you agree with NICTA staff's proposed conclusion that Digicel has a substantial degree of market power in the retail mobile services market, do you also agree that that market power is harmful to competition for the reasons identified by NICTA staff? Provide evidence and data to support your answer.

7 Is it appropriate to consider a retail service determination in the present case?

7.1 Summary

Having concluded that Digicel's SMP and its on-net/off-net price discrimination is harmful to the development of effective competition and that it would be appropriate to consider some form of regulatory intervention, NICTA staff considered whether or not it would be appropriate for NICTA to recommend the making of a retail service determination. In particular, they considered whether it would be appropriate for NICTA to develop a specific proposal for a retail service determination and consider it against the statutory retail regulation criteria. A retail service determination is one way in which the identified problems could be addressed. As such, it was necessary to determine whether, in the circumstances, the consideration of a retail service determination would be a superior or inferior option compared to other regulatory alternatives (discussed below).

NICTA staff considered what a retail service determination could potentially do, what alternatives there were to the making of a retail service determination, the pros and cons of the various options, and the experiences of other jurisdictions in dealing with similar issues. NICTA staff's conclusions on these matters, including the main options that NICTA staff considered, are discussed below. In short, NICTA staff concluded that the best option available to NICTA in the circumstances was to consider the making of a retail service determination that establishes a non-discrimination pricing principle.

7.2 What a retail service determination may do

A retail service determination is a regulation that is made by the Minister based on the recommendation of NICTA. Depending on the nature of any problem identified by NICTA through a public inquiry, a retail service determination may specify the price(s) of particular retail services, service standards or pricing principles setting out the conditions under which those services may be supplied. More specifically, as set out in section 161 of the Act, a retail service determination may:

(a) regulate prices for the supply of the retail service, including (without limitation):
- fixing a price or the rate of increase or decrease in a price, including a maximum or average price or rate; or
- controlling a price by requiring changes in that price to be consistent with a pricing formula, including one that makes reference to, relies upon or otherwise controls several prices, including that price, so long as each of those prices are prices for applications services that are subject to price control; or
- specifying an amount determined by reference to a general price index, the cost of production, rate of return on assets employed, quantity, location, period or any other specified factor; or

- fixing a maximum revenue, or maximum rate of increase or minimum rate of decrease in maximum revenue from the retail service; or
- requiring prices to be consistent with any relevant international benchmarks for prices, costs and return on assets, taking into account the particular circumstances of Papua New Guinea; or
- requiring the operator licensee supplying the retail service to submit tariffs to NICTA on a periodic basis for prior written approval on such terms as are specified in the retail service determination, including traffic forecasts; or

(b) specify service standards that the operator licensee supplying the retail service must meet, together with:
- payments which that operator licensee must make to any retail customers (whether by way of rebate or otherwise); or
- price reductions which must apply,

if the operator licensee fails to meet those service standards; or

(c) specify any pricing policies and/or principles that must be complied with by the operator licensee in pricing the retail service; or

(d) specify conditions relating to the price of the retail service, including that any calculation is to be performed, or a matter is to be determined, by NICTA; or

(e) require the operator licensee to provide specified information to NICTA, retail customers, or any other persons on such terms as are specified in the retail service determination; or

(f) require the operator licensee to supply the retail service in particular areas or to particular classes of retail customer, provided it has the technical capability to do so over its existing network in the relevant geographic areas; or

(g) require the operator licensee to comply with any terms and conditions advised by NICTA that NICTA considers are necessary or desirable to give effect to any of the matters listed in (a) to (f) above or to monitor compliance with the retail service determination.

7.3 Principles

In the first discussion paper, NICTA staff set out six principles that reflected NICTA's general posture in relation to intervention in pricing matters in retail markets and which would guide NICTA's general exercise of its powers under Part VII of the Act. Those principles are set out below.

Principle 1: NICTA believes that retail prices are best determined by market forces provided that those markets are effectively competitive.

Principle 2: NICTA will be cautious about imposing retail price controls where a market is still developing and where those controls may distort market development and investment.

Principle 3: NICTA would prefer to refrain, if practicable, from intervening in the setting of retail prices and instead facilitate retail competition where it is necessary to do so through the regulation of wholesale markets.

Principle 4: If retail prices are predatory or excessive, NICTA would prefer to set price constraints in a form that still provides market participants with some flexibility in setting efficient prices rather than establishing absolute price floors and/or price ceilings.

Principle 5: NICTA will not set retail price floors or ceilings based on the retail prices of other market participants unless those prices can be shown to be relevant, efficient and competitive.

Principle 6: If there is ineffective competition (through SMP) in a retail market, and some form of regulatory intervention is considered necessary, NICTA will adopt measures that encourage greater and more effective competition either between existing operators or by encouraging the entry of additional competitors. NICTA considers that such an approach is likely to be more effective than simply adjusting the competitive balance between existing operators through retail price controls.

The comments received from respondents to the first discussion paper where generally supportive of the attitude reflected in the six principles and NICTA staff do not consider any changes to the principles to be necessary.[212] Consequently, the above-mentioned principles continue to reflect NICTA's general disposition on retail price regulation. NICTA staff took account of these principles in determining whether or not it would be appropriate for NICTA should consider making a retail service determination in the present case.

[212] NICTA staff noted Digicel's comment that the proposed principles were 'interesting and potentially to be welcomed' but that they are 'clearly not sufficient to guide regulatory analysis and decision making' and should include some 'reference to the use of a proper and disciplined analysis of competition and efficiency with and without proposed regulations' (Digicel (2011a) paragraphs 121-122). As NICTA staff explained in the first discussion paper, the principles do not (and cannot) replace analysis, statutory criteria or best practice regulatory processes. They simply reflect NICTA's general disposition to retail price regulation and therefore provide useful guidance to industry and NICTA staff on NICTA's general disposition to any issues that may arise under Part VII of the Act. That does not mean that the principles replace detailed analysis, evidence-based decision-making or other required or generally accepted practices, or any other issues that NICTA must or wishes to take into consideration in the determination of a specific matter. As for the suggestion that the principles should include the use of 'proper and detailed analysis', NICTA considered that such is a general principle of regulatory practice and not specific to retail price regulation and therefore does not need to be specifically reflected in these particular principles.

7.4 Option (a): NICTA refrains from ex ante intervention and instead relies on ex post regulation

This option was considered as an alternative to the making of a retail service determination.

Under this option NICTA would not consider making a retail service determination and instead leave the competition problems resulting from Digicel's SMP and on-net/off-net price discrimination practices to be addressed through ex post regulation. That is, leave the matter to be addressed by the ICCC under the *Independent Consumer and Competition Act 2002*.

However, such a reliance on ex post competition laws alone is only realistic where there is effective competition in the relevant market, and this is not the case in the retail mobile services market (as Digicel was found to have SMP). Although the potential for ex post punishment of anti-competitive behaviour can act as a deterrent to such behaviour, the behaviour can still cause considerable harm before it is officially found to constitute illegal behaviour, punished and discontinued. Irreversible damage to competition may occur in the meantime. For example, the prospect of on-net/off-net price discrimination eventually 'tipping' mobile markets into long term dominance by the larger network operators has been noted by Cabral (2011). Also, Cabral (2011) found high market shares induced by on-net/off-net price discrimination tend to endure for a long time, helping to reinforce the dominance of the larger network operator.[213]

A similar conclusion was noted by Cave, Stumpf and Valletti (2006):

> 'Competition policy may actually tackle many of these issues [of on-net/off-net price discrimination] ex post. The only obvious danger when relying on competition policy has to do with timing. Given entry dynamics and the fact that some entrants are still small players at early stages of their development, the impact of competition policy may happen too late, and imposing ex ante regulation may work better.'[214]

Accordingly, NICTA staff concluded that some form of ex ante protections—in addition to the existing ex post laws—are necessary to protect and facilitate competition and counter the risk of either the identified harm or the identified incentive being acted upon.

NICTA staff note that option (a) is demonstrated in the cases considered by the *Autorité de la concurrence* in relation to the French overseas regions (discussed in section 6.4.2 above). However, unlike the national regulatory authority for those markets (France's ARCEP), NICTA has ex ante regulatory options available to it in

[213] Cabral, L. (2011) op.cit.

[214] Cave, M. et.al. (2006), op.cit. p.85

relation to retail markets that were not, under the European Commission's directives, available to ARCEP. (Hence ARCEP effectively adopted the approach reflected in option (b) below). In that case, although the ex post approach was effective in the sense that a problem was identified, punished and discontinued, it was not effective in another, possibly more important, sense as substantial damage to competition occurred in those markets before the problematic behaviour was discontinued.[215] [216]

Accordingly, when considered against the other options that were available, NICTA staff concluded that option (a) was not the best option available. Indeed, it might be considered a last resort option.

7.5 Option (b): NICTA focuses further upstream and introduces ex ante regulation at the wholesale level instead of the retail level

This option was considered as an alternative to the making of a retail service determination.

Under this option, instead of considering making a retail service determination, NICTA would try to address the competition problems resulting from Digicel's SMP and on-net/off-net price discrimination practices through ex ante regulation in relevant wholesale markets, most likely the markets for call termination on individual networks.

Generally speaking, NICTA staff believe that regulators should be concerned to ensure that wholesale markets for access to network services operate to ensure that downstream retail markets are effectively competitive. This is reflected in principle three. This is because the type of ineffective competition or SMP that leads to pricing-related problems in retail markets is often the result of ineffective competition and SMP in an upstream wholesale market. It is considered to represent the least intrusive form of regulation as it does not directly seek to control the pricing or sales approaches of a service provider. A regulatory focus on wholesale markets also minimises the risk of discouraging new firms from entering the market. Firms enter markets where profit opportunities can be identified. However, if opportunities for profit at the retail level are minimised by the regulatory intervention at the retail level—that is, potential profits are

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[215] NICTA staff note that Bouygues Telecom, the parent company of Bouygues Telecom Caraïbe, exited French Guiana, Guadeloupe and Martinique in 2006. Bouygues Telecom Caraïbe was acquired by the Digicel Group.

[216] NICTA staff also noted evidence submitted by Trilogy International Partners (a part owner of bemobile) to the New Zealand Commerce Commission as part of an inquiry into mobile termination pricing in 2009. Trilogy states that the founders of its company had previously be involved as founders and managers in a company that entered the Slovenia mobile telecommunications market in 2001 (under the brand name VEGA) and exited in 2005 after achieving a market share of only 2%. The key reason for VEGA's failure, according to Trilogy, was because the MNO with SMP (Mobitel) locked-in its customers through anti-competitive price discrimination between on-net and off-net calls and the regulator did not intervene. See Letter dated 27 July 2009 from Mr Stewart Sherriff, Senior Vice President and Chief Technology Officer, Trilogy International Partners to Mr Mark Berry, Chair Commerce Commission of New Zealand, available at www.comcom.govt.nz/assets/Imported-from-old-site/industryregulation/Telecommunications/Investigations/MobiletoMobileTermination/ContentFiles/Documents/Trilogy-International-Partners-submission-27-July-2009.pdf

regulated away—then it is unlikely that firms would seek to enter those markets and potential competition may be deterred. NICTA staff would generally only contemplate regulatory intervention in retail markets if wholesale market remedies are inadequate or unlikely to produce competitive outcomes in the short to medium term.

The national regulatory authorities in many countries—in particular, those of the European Union—have typically focused on reducing MTRs to the level of Long Run Incremental Cost (LRIC) to address the competition problems caused by on-net/off-net price discrimination. This is a reflection of both the European Commission's recommendations and the preference for regulatory intervention at the wholesale level instead of the retail level in the expectation that regulated wholesale outcomes would flow through to reasonable off-net pricing.

NICTA staff believe that if the MTR in PNG was at LRIC there would be reduced scope for Digicel to price discriminate between on-net and off-net calls to the extent that it currently does. However, even if the MTR was lower or set at LRIC, the incentive and ability to engage in such discrimination would likely still remain. This is evident from the experiences of Turkey, Portugal and Singapore among others.[217] In Turkey in 2007 and again in 2009 and 2010, the ICT Authority (ICTA) found it necessary to impose ex ante regulation on Turkcell, the mobile network operator with SMP, in the form of a non-discrimination rule regarding on-net pricing and an off-net price cap, despite MTRs being regulated at cost-oriented prices and (in 2010) being lower than the MTRs in any of the European Union countries.[218] In Portugal in 2010, ANACOM found that its regulated reductions in MTRs since 2005 had not adequately addressed its concerns about the anti-competitive effects of on-net/off-net price discrimination.[219] In Singapore, the IDA prohibited on-net/off-net price discrimination from October 2001 to January 2005, despite MTRs being effectively set at zero as a consequence of Singapore's adoption of bill-and-keep for mobile termination.[220]

Further, NICTA's power to intervene in the pricing of the domestic mobile terminating access service (a declared service under section 131 of the Act) are more limited than the price-setting powers of many other national regulatory authorities, particular those in the European Union. Whereas those regulators typically have the power to specify the wholesale prices of their equivalent of a declared service, NICTA may only determine wholesale pricing as part of the arbitration of a relevant access dispute (ss.143–155).

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[217] Such as Columbia in 2009 and Namibia pre-2011.

[218] TMG (2011) op.cit. pp.19–20

[219] ANACOM (2010) *Decision on wholesale markets for termination of voice calls on individual mobile networks*, p.26, available (in Portuguese) at www.anacom.pt/streaming/Decisao_AnaliseMercado7.pdf?contentId=1026267&field=ATTACHED_FILE

[220] Info-communications Development Authority of Singapore (IDA), (2001) *IDA's Decision on Differentiated Mobile Pricing, Press Release*, available at www.ida.gov.sg/News%20and%20Events/20061115094612.aspx?getPagetype=20.

Accordingly, although NICTA has a preference for regulatory intervention at the wholesale (rather than retail) level as reflected in principle three, NICTA staff concluded that option (b) was neither practicable in the circumstance nor likely to be effective.

7.6 Option (c): NICTA directly regulates Digicel's retail prices

Given NICTA's guiding principles on retail price regulation, NICTA staff reluctantly considered the option of direct regulatory intervention in retail pricing. Such intervention can take many forms under a retail service determination. A determination could specify prices by reference to various factors, such as costs, international benchmarks or particular rates of return. It may set price ceilings or price floors or involve NICTA in the approval of tariffs.

Such direct interventions have been adopted in a number of countries to address problems relating to on-net/off-net price discrimination. For example, in Bangladesh a 'price circuit' sets price floors for on-net and off-net mobile calls and a price ceiling for all mobile calls (whether on-net or off-net).[221] In Turkey a price floor applies to the on-net calls of the MNO with SMP and a price ceiling applies to all MNOs' off-net calls.[222] A price floor for off-net mobile calls currently applies in Cambodia and is currently being considered in Uganda.[223]

However, NICTA staff recognise that regulators face a dilemma if they contemplate regulating the level of retail prices in an uncompetitive market. Firms enter markets where profit opportunities can be identified. New competitors will therefore be dissuaded from entering the market if they perceive their potential retail profits being diminished by the regulator. The regulator's intervention thus risks dampening competition, the absence of which was the reason for its intervention in the first place. The continuing lack of competition thus reinforces the perceived need for the regulator to interfere with retail prices, thereby perpetuating the problem and undermining the regulator's efforts to establish efficient price levels that might encourage investment and competition. Digicel referred to this dilemma in its submission.[224]

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[221] Under the Bangladesh Telecommunications Regulatory Commission's (BTRC's) price circuit, the minimum on-net mobile call rate is 0.25 BDT, the minimum off-net mobile call rate 0.65 BDT, and the maximum mobile call rate (whether on-net or off net) is 2.00 BDT.

[222] An ICTA board resolution dated 25th March 2009 set a price floor for Turkcell's on-net calls thus: the weighted average on-net price of every subscription tariff package must not be less than Turkcell's weighted average call termination rate. ICTA's price ceiling for off-net calls, which originally applied only to Turkcell but was subsequently extended to cover all MNOs, caps the price of an off-net mobile call at TRY 0.40 per minute (equivalent to approximately 43 to 46 toea as of March 2012). Source: Turkcell (2011), *Annual report for the fiscal year ended December 31, 2010*, pp.62–64, available at www.turkcell.com.tr/Documents/investorkit/20110421_As_Filed.pdf

[223] Wafula, Walter (2011) 'Uganda: The cost of persistent telecom industry price wards', *All Africa*, 23 August 2011, available at http://allafrica.com/stories/201108241321.html

[224] Digicel (2011a) op.cit. paragraph 24

NICTA staff believe that a competitive market is much better at setting prices than regulation. This is reflected in principles one and three. However, in the absence of effective competition in a market, it may be necessary for the regulator to intervene to mimic the pricing outcomes that would be expected in a competitive market until competitive market forces strengthen. Nevertheless, NICTA staff believe that it is important to adopt minimalist approaches to ex ante price regulation that leave maximum room for competition to develop and minimises the distortive effects. This is reflected in principles two, four and six.

NICTA staff noted that none of bemobile, Digicel or Telikom supported direct intervention in retail pricing by NICTA in the sense of setting or approving retail prices. Digicel highlighted the risks of 'downstream impacts on investment, innovation and competition'.[225] bemobile stated that it does 'not advocate NICTA setting prices or imposing [price] caps [because] that would not adequately address the problem and potentially stifle competition'.[226]

In light of all the concerns about direct intervention in retail pricing, and when considered against the other options available, NICTA staff concluded that option (c) was not the best option available in this particular case, and at this time, subject to the success of another more appropriate option in the next section(option d).

7.7 Option (d): NICTA introduces a non-discrimination pricing principle/policy

A retail service determination may specify particular principles or policies that a licensee must abide by when structuring and setting its retail prices. This is a much less intrusive form of price regulation as it leaves the service provider in control of its prices and avoids the risks associated with direct price setting and the other forms of price regulation that fall within option (c) above.

In its response to the first discussion paper, bemobile suggested that NICTA consider making a retail service determination that prevents any retail price discrimination for national calls or SMS generated by customers of Digicel.[227] NICTA staff have considered this option of a non-discrimination pricing principle/policy together with the other options mentioned above.

In its submission, in reference to the introduction of a non-discrimination rule by the national regulatory authority in Kenya, bemobile noted that the Communications

[225] Digicel (2011a), op.cit. paragraphs 23–31

[226] bemobile (2011a) op,cit. p.50. NICTA staff note that bemobile changed its view from that expressed to the NICTA CEO in its original letter of complaint (dated 27 January 2011) regarding Digicel's on-net/off-net price discrimination, which requested that NICTA make a retail service determination that capped the retail price of Digicel's off-net calls to bemobile at 99 toea per minute and capped the price of Digicel's off-net SMS to bemobile at 25 toea per message.

[227] bemobile (2011a), op.cit. paragraph 3.7

Commission of Kenya (and its external advisors, Analysys Mason) viewed such a rule as the regulation of the *structure* of retail prices rather than regulation or setting of the actual prices.[228] That distinction has been recognised by other national regulatory authorities, such as ictQATAR,[229] and also in the academic literature, such as in Cave, Stumpf and Valletti (2006)[230] and Harbord and Pagnozzi (2008).[231] NICTA staff consider this an important distinction as it reflects the fact that a service provider that is subject to a non-discrimination pricing rule retains pricing flexibility and control over the pricing of its services and does not involve the regulator in price setting. Consequently it is also consistent with principle six.

NICTA staff also found that there was considerable recent international precedent for this form of regulatory intervention in response to on-net/off-net price discrimination by MNOs, particularly in developing economies. It has been adopted in similar circumstances through various means in a number of countries, including:

- **Qatar**: In 2011, Qtel was found to have SMP in the retail mobile services market and was obliged to refrain from on-net/off-net price discrimination, including for voice calls, video calls, SMS and MMS.[232]
- **Namibia**: In 2011, the Namibian Communications Commission introduced a principle of non-discrimination between the retail pricing of on-net and off-net calls (applicable also to mobile-to-fixed calls as the MTR in Namibia is equal to the FTR). This rule applies to all MNOs. Although this principle was imposed through the (already established) process of tariff approval and is formally called a price cap, it is effectively a non-discrimination rule.[233]
- **Kenya**: Since 2010, all MNOs designated as having SMP in a retail market have been prohibited from charging prices for off-net calls that are above the level of the corresponding on-net calls.[234] Although this is formally described as a price cap, it is effectively a non-discrimination rule.
- **Paraguay**: In 2010, CONATEL issued a decree prohibiting both MNOs from charging different prices for on-net and off-net calls.[235]
- **Thailand**: In 2010, the NTC issued an order under section 57 of the *Telecommunications Business Act 2001* prohibiting any price discrimination between on-net and off-net mobile calls.[236]

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[228] bemobile (2011a), op.cit. p.50

[229] ictQATAR (2011), op.cit.

[230] Cave, M. et. al. (2006), op,cit. p.85

[231] Harbord, D. And Pagnozzi, M. (2008), op,cit.

[232] ictQATAR (2011), *op.cit.*

[233] NCC (2011) op.cit. pp.11–12,

[234] CCK (2010a) op.cit.

[235] *Comision Nacional de Telecomunicaciones Asuncion* (CONATEL) *Decree No. 5134*, dated 28 September 2010, paragraph (h). Confirmed through correspondence with CONATEL staff.

[236] Section 57 of the Telecommunications Business Act requires, among other things, that licensees not set tariffs in such a way that has anti-competitive effects or restricts fair competition and that licensees charge retail customers the same rate for similar nature or categories of telecommunications service.

- **Bolivia**: in 2010, the National Congress passed legislation that prohibits on-net/off-net price discrimination by MNOs;[237]
- **Colombia**: In 2009, COMCEL was found to have SMP in a retail mobile market and obliged to charge off-net prices that are equal to or lower than COMCEL'S on-net prices plus the MTR.[238]
- **United Arab Emirates**: On-net/off-net price discrimination by MNOs is prohibited under section 3.2 of the TRA's Price Control Policy of 2008 which states: 'A licensee shall not put into effect any price which could restrict, distort or prevent the growth and development of the telecommunications sector of the UAE'.[239]

When considered against the other options that were available, NICTA staff concluded that option (d) was currently the best option available.

7.8 Proposed conclusion

NICTA staff have concluded that it is appropriate in the circumstances for NICTA to consider making a retail service determination to address the competition problems arising from Digicel's SMP and its incentive and ability to price-discriminate between on-net and off-net calls in a manner that is anti-competitive. Further, the retail service determination to be considered would establish some form of non-discrimination pricing principle or policy.

Specific questions for stakeholders

Question 11: Do you agree with NICTA staff's proposed conclusion that it is appropriate for NICTA to consider the making of a retail service determination, in the circumstances in the form of a non-discrimination pricing principle or policy? Provide evidence to support your answer.

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[237] Article 43 of the *Telecommunications, Information and Communications Technology Law* (Law 164, August 2011), available (in Spanish) at www.gacetaoficialdebolivia.gob.bo/normas/view/139394

[238] CRC (2009) op.cit.

[239] Telecommunications Regulatory Authority of UAE (TRA) (2008) *Regulatory Policy: Price Control,* version 2.1, available at www.tra.gov.ae/download.php?filename=policies_regulations/Price%20Control%20Regulatory%20Policy%20v2.pdf. The prohibition of on-net/off-net price discrimination was confirmed through correspondence with the TRA staff.

8 A specific proposal for a retail service determination

8.1 Summary

Having concluded that it was appropriate for NICTA to consider making a retail service determination that establishes a non-discrimination pricing principle/policy, NICTA staff began to focus on the drafting of appropriate terms for such a proposed determination. In short, NICTA staff propose a retail serviced determination that:

- applies only to Digicel;
- applies only to Digicel's supply of mobile originated national retail voice call services;
- establishes a pricing principle that prevents discrimination between on-net and off-net prices except to the extent that any such differences are objectively justifiable based on differences in costs; and
- applies for a period of five years.

A brief overview of these proposed terms is provided below. A draft determination reflecting this proposal is provided at Annex C for reference and comment. However, respondents should note that as any retail service determination is made by the Minister and not NICTA (and thus drafted by the Ministry, not NICTA staff), any actual determination that may eventuate from the present inquiry may be different in style or form from that reflected in Annex C.

8.2 Proposed licensee

A retail service determination must specify the operator licensee to which it applies (s.161). Although a retail service determination may apply to more than one licensee, it may only apply to licensees that have SMP in the market in which the retail service is supplied (s.158). As NICTA staff found that Digicel alone has SMP in the retail mobile services market, NICTA staff propose that the retail service determination apply only to Digicel.

8.3 Proposed retail service

A retail service determination must specify the particular retail service to which it applies (s.159, s.161). It does not need to apply to all of the services in the market in which the particular retail service is supplied. As NICTA staff found that Digicel's on-net/off-net price discrimination was greatest and most problematic in relation to its supply of national voice telephony, and does not appear to be as problematic, or as likely to be problematic, in relation to its supply of SMS or MMS services, NICTA staff propose that the retail service determination apply only to Digicel's supply of mobile originated national retail voice call services (that is, not also to SMS and MMS services or any other types of retail mobile services that might be introduced during the period the determination is in effect). Further, the determination would apply only to mobile-to-mobile call services (i.e. not also to mobile-to-fixed call services which always terminate off-net) and only to prepaid services (i.e. not also to post-paid services).

As NICTA staff's focus has been on the market for domestic mobile services and not international services, it is proposed that the retail service determination apply only to national calls and not international calls. International calls are always off-net so it is difficult to conceive how the non-discrimination principle envisaged could be useful in that context in any case.

8.4 Proposed period

A retail service determination must specify an expiry date that is not longer than five years from the commencement of the determination (s.159). A determination may not apply retrospectively (ss.161(3)).

NICTA staff propose that the retail service determination remain in effect for a period of five years unless revoked earlier on the basis that Digicel is found to no longer have SMP in the retail mobile services market.

NICTA staff intend to review the effects of the determination after it has been in operation for two years. That review may identify a need for an inquiry to consider an amendment to or revocation of the determination. If circumstances change later in the life of the determination—after the planned review—then a further review and/or inquiry can be instituted. NICTA staff cannot at this stage foresee beyond the two year horizon of this study, and there is nothing in that time that points to an end of the threat of harm from Digicel's market power.

8.5 Proposed terms

A retail service determination may specify a pricing policy and/or principle that must be complied with by a licensee in its pricing of a retail service (s.161(2)(c)). A determination may also specify conditions relating to the pricing of a retail service that are to be determined by NICTA (s.161(2)(d)) and require a licensee to supply specified information to NICTA on specified terms (s.161(2)(e)).

NICTA staff propose that the retail service determination establish a pricing principle that there must be no discrimination in the pricing of mobile originated national voice call services based on the terminating mobile network unless such discrimination can be objectively justifiable based on differences in the associated costs. For that exception to apply, Digicel would need to demonstrate to NICTA's satisfaction that its costs are different for its supply of mobile originated national voice call services to different terminating mobile networks—including on-net termination on its own network—and that, as a consequence, a specific difference in the retail prices is warranted, and the quantum of that difference.

For the purposes of NICTA's monitoring of the effects of the determination, NICTA staff also propose that Digicel submit to NICTA every quarter information that shows:

(i) the number of national call minutes that originated on Digicel's network during each calendar month; and

(ii) the proportion of those minutes that terminated on-net, off-net on bemobile's mobile network, off-net on Telikom's mobile network, and off-net on the fixed network.

Specific questions for stakeholders

Question 12: Do you agree with the terms of NICTA staff's proposal for a retail service determination (as described in section 8 and set out in Annex C)? If not, please identify the specific amendments that you think are necessary and accompany those proposed changes with an explanation as to why such changes are necessary.

9 Assessment against retail regulation criteria

9.1 Summary

NICTA staff have assessed the proposed retail service determination described in section 8 and set out in Annex C against the statutory retail regulation criteria and believe that the proposed determination satisfies all of the criteria.

9.2 The retail regulation criteria

NICTA may only make such a recommendation to the Minister if NICTA believes that subjecting the retail service to a retail service determination would meet all four of the retail regulation criteria set out in section 158 of the Act. Those criteria are:

(a) that making a retail service determination for the retail service in respect of an operator licensee for a particular period will further the achievement of the objective set out in Section 124, but disregarding Section 124(2);[240] and

(b) specifically, in relation to the competition objective, that –

(i) that operator licensee has a substantial degree of power in the market within which the retail service is supplied; and

(ii) in the absence of the retail service determination for that period, that substantial degree of power is likely to –

(A) persist in the market over that period; and

(B) expose retail customers to a material risk of higher prices and/or reduced service where they acquire the retail service from that operator licensee during that period; and

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[240] Section 124(1) of the Act states 'The objective of this Part [Part VI] and Part VII of this Act is to –
(a) promote effective competition in markets for ICT services in Papua New Guinea, to be known as the "**competition objective**", subject to –
(b) promoting the economically efficient use of, and the economically efficient investment in, the facilities by which ICT services may be supplied, to be known as the "efficiency objective"'.

Section 124(2) of the Act, which is to be disregarded in any consideration of the retail regulation criteria, states 'In determining the extent to which a particular thing is likely to further the achievement of the efficiency objective, regard shall be had (without limitation) to all of the following matters –
(a) whether it is technically feasible for the relevant ICT services to be supplied, having regard to –
(i) the technology available or likely to become available; and
(ii) the reasonableness of the costs involved; and
(iii) the effect of supplying the ICT services on the integrity, operation or performance of other ICT services or facilities; and
(b) the legitimate commercial interests of the access provider in supplying the ICT services, including the ability of the access provider to exploit economies of scale and scope; and
(c) the incentives for investment in the facilities by which the ICT services may be supplied, including the risks involved in making the investment.'

(c) specifically, in relation to the efficiency objective, that the operator licensee will not be prevented from achieving a return on assets during that period sufficient to sustain investment necessary to supply the retail service; and

(d) the aggregate likely benefits of making that retail service determination outweigh any aggregate likely detriments.

NICTA staff's conclusions following their consideration of each criterion are summarised below.

9.3 Criterion 1: The competition and efficiency objectives

The first retail regulation criterion is that making a retail service determination for the retail service in respect of an operator licensee for a particular period will further the achievement of the objective set out in section 124 of the Act (but disregarding subsection 124(2)).

In relation to the competition objective, this discussion paper has already set out the ways in which NICTA staff have concluded on the evidence and having regard to the academic literature and practices in other relevant jurisdictions that the proposed determination will effectively reduce the anti-competitive effects of the price discrimination associated with the differences between off-net and on-net call pricing. By removing a barrier to effective competition the proposed determination will promote effective competition in the retail mobile services market as required in section124(a) of the Act. Further it should do it better than any alternative approach available to NICTA. If the determination is not made then the risk of further harm from SMP will not be addressed and the harm that has been described (and realised so far) will continue to the detriment of effective competition in the retail mobile services market.

This paper has set out the harm for consumer welfare and competition that is posed by the level of discrimination that is currently reflected in Digicel's prices for on-net and off-net mobile calls. If Digicel's past or future investments are based on the low level of competition that will inevitably result from a continuation of this price discrimination, to the extent that it is not warranted by differences in the costs of on-net and off-net call termination, then that investment will tend to be inefficient. It will lack the discipline and shaping that occurs when investment into effectively competitive markets is being considered. There is also the matter of efficient investment by competing mobile operators – bemobile and Telikom. In making their investments these operators are entitled to assume that the market will be reasonably and sustainably competitive, or, at the least, that discriminatory pricing behaviour with inevitable anti-competitive effects will not be permitted to persist. Such pricing undermines the incentive that competing operators have to invest and reduces their investment below the level that would otherwise be sustained in future investments in PNG. This is inefficient.

9.4 Criterion 2: Substantial market power

The second retail regulation criterion has three aspects that all relate specifically to the competition objective:

(a) that the operator licensee has a substantial degree of power in the market within which the retail service is supplied;
(b) in the absence of the retail service determination for that period, that substantial degree of power is likely to persist in the market over that period; and
(c) in the absence of the retail service determination for that period, that substantial degree of power is likely to expose retail customers to a material risk of higher prices and/or reduced service where they acquire the retail service from that operator licensee during that period.

Each aspect was considered in turn.

9.4.1 Criterion 2(a): Substantial market power

Mobile originated national retail voice call services are supplied in the retail mobile services market defined in section 3 of this discussion paper. As discussed in section 5 of this discussion paper, NICTA staff found that Digicel has SMP in that market. Accordingly, NICTA staff are satisfied that this criterion is met.

9.4.2 Criterion 2(b): Persisting substantial market power

As discussed in section 5 of this discussion paper, in the absence of ex ante regulatory intervention there is every indication that Digicel's SMP will persist. Indeed, as also covered in section 5, the consequence of continuing discriminatory pricing of the kind described is more likely than not to augment and reinforce Digicel's SMP over time. Accordingly, NICTA staff are satisfied that this criterion is met.

9.4.3 Criterion 2(c): Substantial market power and the risk of higher prices and/or reduced service

With continuing SMP comes a continuing ability on the part of the operator involved, to make decisions without having due regard to the responses or likely responses of customers and competitors. Indeed, this is the concept that forms the core of SMP—an ability not to be constrained or concerned by competitive forces and competitive consequences. This discussion paper has already discussed the consequence that, in the absence of ex ante regulatory intervention in the form of the proposed retail service determination, SMP will continue and the risks of harm from that SMP—in the form of very high off-net prices as part of anti-competitive price discrimination practices that risk foreclosing the market to competition and thereby reducing service in the long term—will continue to be present in the market. Accordingly, NICTA staff are satisfied that this criterion is met.

9.5 Criterion 3: Achievement of a return on assets

The third criterion relates specifically to the efficiency objective and requires that the operator licensee will not be prevented from achieving a return on assets during that period sufficient to sustain investment necessary to supply the retail service.

NICTA staff have interpreted this criterion as requiring a suitable, adequate or commercial return on the assets that an operator employs taking account of the adjustments necessary for the associated risks. NICTA staff have therefore concluded that the return referred to cannot be any return, but must be of an order to encourage efficient investment as mentioned earlier in section 124 of the Act. In this NICTA staff have adopted a meaning of return that is aligned with the pro-investment objectives of the Act and which also aligns with commercial realities.

As the proposed determination does not increase the cost burden on Digicel, and as on-net/off-net price discrimination will continue to be permitted if there is are differences in the associated costs, NICTA staff are satisfied that the proposed determination would not prevent Digicel from achieving a return sufficient to encourage efficient investment. Accordingly, NICTA staff are satisfied that this criterion is met.

9.6 Criterion 4: The likely benefits outweigh the likely detriments

The fourth criterion is that the aggregate likely benefits of making the retail service determination outweigh any aggregate likely detriments. This goes to the specifics of the determination itself as well as to the fact of a determination.

Section 6 of this discussion paper sets out how the retail mobile services market is being subjected to pricing arrangements of major anti-competitive importance and effect. Inaction (i.e. no regulatory intervention) would be of major detriment to competition in the retail mobile services market and thus also to consumers' interests. As explained in section 6, inaction will allow Digicel to (continue to) price discriminate in such a manner that it induces a club effect and network effects that are so strong that they effectively lock customers into the Digicel network and raise the barriers to switching, expansion and entry. Further, inaction will also allow competition to be harmed as non-SMP operators will remain unable to compete with Digicel's on-net pricing and will continue to have potential incoming call traffic (and with it termination revenue) unfairly reduced by the artificial incentives created by Digicel's high off-net pricing. However, as set out in Section 7 of this discussion paper, NICTA staff have considered various options for regulatory intervention and concluded that a simple non-discrimination pricing principle would be the best approach in the circumstances as it would retain for Digicel the ability to use its commercial judgment to set the actual price levels and avoid imposing a regulatory view on what the actual price levels should be. Consequently, in considering the proposed determination against criterion four, the effects of a light-handed and effective approach to controlling the limits of price discrimination are being compared to the inevitable detriments of taking no regulatory action at all.

NICTA staff have considered the benefits and detriments of the proposed determination and compared them with the counter-factual, that is, with the benefits and detriments of taking no regulatory action at all. As many of the detailed costs and benefits are known only to Digicel and/or the other MNOs, NICTA staff were unable to undertake a quantitative analysis and instead conducted a qualitative comparative analysis using the framework explained below. In any event NICTA staff considered this to be a more appropriate approach to weighing the aggregate benefits and detriments in the circumstances. This was for two main reasons. Firstly, criterion four does not require a cost-benefit analysis as such, but instead for the aggregate benefits and aggregate detriments of the propose determination to be weighed. Secondly, as the proposed determination provides Digicel with the flexibility to determine how it will comply with the non-discrimination pricing principle, there is no firm or single scenario or definite outcome from the proposed determination that can be definitively costed.

In relation to the latter point, Digicel has stated that any imposition of a non-discrimination pricing principle '...is likely to result in a significant re-balancing of mobile retail prices, i.e. an increase in [the] price for [Digicel's] on-net calls'.[241] NICTA staff recognise that this is one possible response by Digicel to the proposed determination. However, any such price rise would be a short term detriment (to Digicel's customers) in the interests of a longer-term benefit in the form of an effectively competitive market, which is in the long-term interests of all mobile phone users (including Digicel's customers). NICTA staff do not consider that the only means of complying with the proposed determination is for Digicel to increase on-net prices. There are other possibilities, some of which would be competitively creative and benefit Digicel's existing customers. As already noted, because there is no single or firm response, it is difficult to assess with certainty the extent of the benefits that will result from implementation of the proposed determination.

In any case, it is not definite that Digicel would raise, or needs to raise, its *average* on-net call price in order to comply with the proposed determination. In Qatar for example, the introduction of a non-discrimination rule led the SMP-operator to reduce its off-net prices to the level of its on-net prices.[242] NICTA staff also note the approach adopted by Digicel's sister company in Jamaica in March 2012 when, in response to increased regulatory attention on the effects of its on-net/off-net price discrimination (but in the absence of regulation), Digicel Jamaica introduced a single price for on-net and off-net

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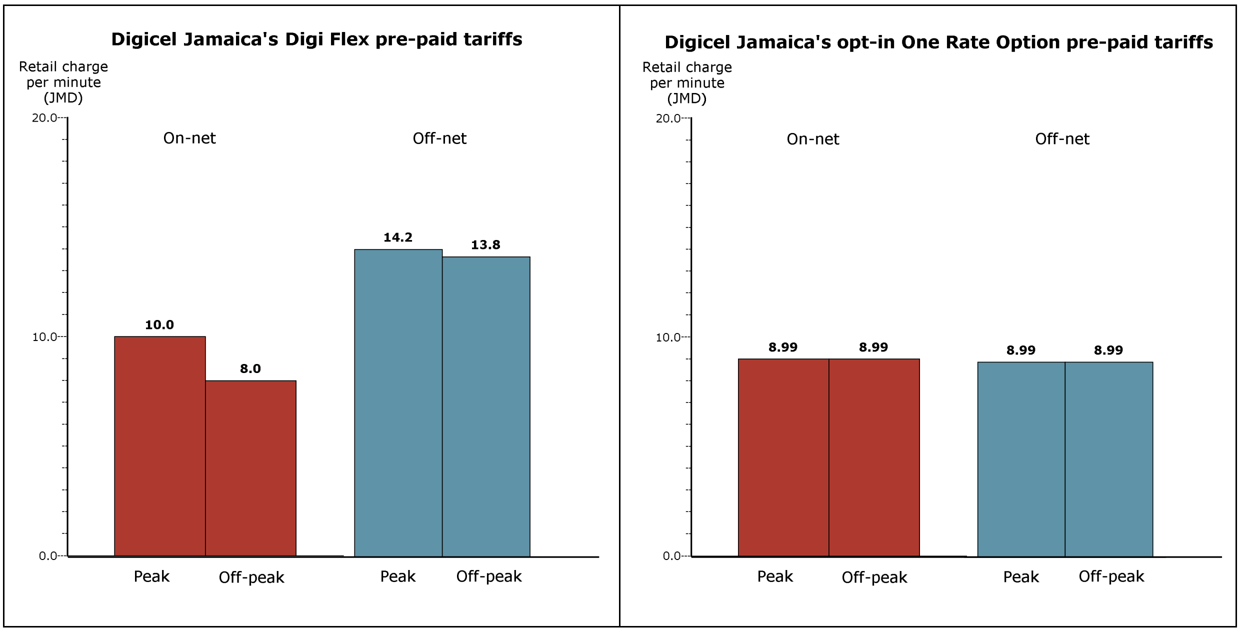
[241] Digicel (2012), op.cit. paragraph 127.

[242] Confirmed through correspondence with ictQATAR.

calls (during both peak and off-peak time) by setting a new price level that was *below* both the existing on-net and off-net (peak time) prices. It thus eliminated on-net/off-net price discrimination by lowering both prices. See Figure 25. In PNG, Digicel may very well increase the price it charges for the second and each subsequent minute of a call because (at 11 toea) it is currently below the MTR and thus would mean that Digicel would impose per minute losses on itself if that same price was applied to the second and each subsequent minute of an off-net call. However, this does not mean that the average price for an on-net call must also increase. Further, the use of two part pricing (where the first minute of a call is charged at a higher rate than the subsequent minutes) is a commercial construct and is not a regulatory requirement or even a widespread approach. As can be seen from Figure 19 (on page 75), there is only one other market (Barbados) in the sample of 25 national markets reflected in Figure 19 where two part pricing is currently used.

Figure 25: Recent price change by Digicel Jamaica that removes on-net/off-net price discrimination



For the purposes of the comparative analysis of the aggregate benefits and aggregate detriments of the proposed determination, NICTA staff assessed and weighed the significance of individual (though not necessarily mutually exclusive) benefits and detriments using a five point scale (where one was the lowest order of magnitude and five was the highest). Consistent with the standard methodologies for cost benefit analyses, NICTA staff's overall concern was with the total economic effect so any redistribution of benefits or costs between parties was not taken into account. For example, if the proposed determination leads to some call traffic, and the associated revenue and profit from that traffic, shifting from one network/operator to another network/operator, that is a redistribution between the parties and not a net increase or decrease in the total balance of benefits/detriments from an economic welfare perspective. The results of that comparative analysis are summarised in Figure 26 (where ‘B’ signifies a benefit and ‘D’ signifies a detriment). In aggregate, NICTA staff are satisfied that the aggregate benefits of the proposed determination outweigh both the aggregate detriments of the proposed determination and the aggregate benefits of inaction. Accordingly, NICTA staff are satisfied that this criterion is met.

Figure 26: Summary of results of comparative analysis of aggregate benefits and detriments

Factual—the scenario where the proposed determination is made			Counter-factual—the scenario where no regulatory action is taken		
1	Merits-based competition: Competition in the retail mobile services market becomes based on merits and costs with consequential market growth and a shift towards an effectively competitive market	BBBB	1	The non-SMP operators are marginalised, unable to compete on price or overcome the increasing barriers to switching and expansion induced by the club effect, leading to a higher risk of the market being foreclosed to competition long-term	DDDDD
2	Service innovation: Competition in the retail mobile services market is on a more level playing field, with MNOs attracting subscribers based on the innovativeness, quality and value of their services instead of disproportionate weight being given to the relative of their subscriber base	BBB	2	Risk of the retail mobile market being foreclosed to competition in the long term	DDDD
3	Optimisation of network effects at the market level instead of at the operator level, enabling the benefits to be enjoyed by all mobile phone users	BBBBB	3	Sub-optimisation of network effects at the operator level that stimulate unduly intense club effects	DDDDD
4	Risk of Digicel’s average on-net prices increasing for the purposes of compliance in the short to medium term	D	4	No risk of Digicel’s average on-net prices increasing for the purposes of short-term compliance.	B
5	The Distortion of mobile originated traffic flows due to price-discrimination is minimised	BBBB	5	Continued distortion of mobile originated traffic flows fostering a risk of a ‘connectivity breakdown’ with resulting diseconomies because of reducing operational scale.	DDD
6	Delayed or reduced investment by Digicel in the retail mobile services market	DD	6	Continued investment in the retail mobile services market by Digicel as the market leader	BB
7	Continued or increased investment in the retail mobile services market by the non-SMP operators	BB	7	Risk of Digicel’s continued investment in the retail mobile services market being influenced by the distorted incentives created by its existing retail pricing strategies, potentially leading to inefficient investment and deterring of efficient market entry.	D
8	Potential for Digicel’s review of its pricing structure to stimulate competition in the retail mobile services market and/or led to increased value being offered to all mobile phone users	BB	8	Risk of Digicel’s customers continuing to be charged prices for off-net calls that are substantially above cost, distorting their consumption of off-net services	DD

9.7 Proposed conclusion

NICTA staff propose to conclude that the proposed retail service determination at Annex C, which establishes a non-discrimination pricing principle applicable to Digicel's supply of mobile originated national retail voice call services, satisfies the retail regulation criteria specified in section 158 of the Act.

Specific questions for stakeholders

Question 13: Has your organisation done any economic modelling of the effect of the proposed determination or of any restriction on on-net/off-net price discrimination? If so, please provide the model and results.

Question 14: Do you agree with NICTA staff's proposed conclusion that the proposed retail service determination (at Annex C) satisfies the statutory retail regulation criteria? Provide evidence and data to support your answer.

10 Next steps in the inquiry process

This discussion paper sets out NICTA staff's findings and proposed conclusions on the matters under inquiry and reflects the course of action that, as of the date of publication of this discussion paper, NICTA staff intend to recommend to the NICTA Board (NICTA). Interested parties are now invited to submit written comments in response to the specific questions and issues raised in this discussion paper, as well as on any other relevant matters. Once NICTA staff have completed their consideration of those submissions and any new evidence that they may contain, NICTA staff intend to finalise a recommendation to NICTA. In the event that the submissions received in response to this discussion paper substantially alter the views and conclusions of NICTA staff, or lead to a substantial change to the proposed retail service determination, then NICTA staff may conduct a further round of public consultation on specific issues. However, interested parties should not rely on there being a further round of public consultation and therefore should respond as if this is the final opportunity.

11 Summary list of discussion questions

Question 1 (for MNOs only): What assumptions about price elasticity of demand do you make when determining or reviewing your retail prices for mobile services?

Question 2 (for MNOs only): What information do you have on price elasticities of demand for mobile services in PNG?

Question 3 (for MNOs only): Do you have any international benchmarks of retail mobile pricing or other information that indicates whether the current retail prices for mobile services in PNG are competitive (i.e. that they are prices that would be set by a competitive market)?

Question 4: Are fixed voice call origination services and mobile voice call origination services in the same market? Is the situation the same for all call types (e.g. local/national calls, international calls, calls to mobile phones, calls to fixed phones)? Please provide argument and evidence to support your views.

Question 5: Do you agree that fixed access services and mobile access services are in separate markets? Please provide argument and evidence to support your views.

Question 6: Are mobile data services and mobile voice (i.e. mobile access and mobile call origination) services is the same market or in separate markets? Please provide argument and evidence to support your views.

Question 7: Do you agree with NICTA staff's proposed conclusion that the relevant market is the national market for retail mobile services with both the inclusions and exclusions as set out in this paper? Provide evidence and data to support your answer.

Question 8: Do you agree with NICTA staff's proposed conclusion that the retail mobile services market is susceptible to en ante competition regulation? Provide evidence and data to support your answer.

Question 9: Do you agree with NICTA staff's proposed conclusion that Digicel has a substantial degree of market power in the retail mobile services market? Provide evidence and data to support your answer.

Question 10: If you agree with NICTA staff's proposed conclusion that Digicel has a substantial degree of market power in the retail mobile services market, do you also agree that that market power is harmful to competition for the reasons identified by NICTA staff? Provide evidence and data to support your answer.

Question 11: Do you agree with NICTA staff's proposed conclusion that it is appropriate for NICTA to consider the making of a retail service determination, in the circumstances in the form of a non-discrimination pricing principle or policy? Provide evidence to support your answer.

Question 12: Do you agree with the terms of NICTA staff's proposal for a retail service determination (as described in section 8 and set out in Annex C)? If not, please identify the specific amendments that you think are necessary and accompany those proposed changes with an explanation as to why such changes are necessary.

Question 13: Has your organisation done any economic modelling of the effect of the proposed determination or of any restriction on on-net/off-net price discrimination? If so, please provide the model and results.

Question 14: Do you agree with NICTA staff's proposed conclusion that the proposed retail service determination (at Annex C) satisfies the statutory retail regulation criteria? Provide evidence and data to support your answer.

Annex A: Overview of the Cellophane Fallacy

The Cellophane Case

Cellophane was a DuPont Company plastic wrapping material that had its U.S. production restricted to du Pont by numerous patents in the early 1950s. Du Pont was sued under the US Antitrust Act for monopolization of the cellophane market by the U.S. Justice Department, and the case was decided by the US Supreme Court in 1956.[243] The Court agreed with du Pont that when evaluated at the monopolistic price observed in the early 1950s, there were many substitutes for cellophane and, therefore, du Pont had only a small share of the market for wrapping materials (i.e., it possessed little or no market power).

This reasoning was challenged by a 1955 article in the American Economic Review.[244] Willard F. Mueller and George W. Stocking, Sr. pointed out the error of mistaking a monopolist's inability to exercise market power by raising price above the current price for an inability to have already exercised market power by raising price significantly above the competitive price.

The broader implications

There is a serious risk that courts and regulators that use a product's elevated market price will typically misconstrue a completed anti-competitive act as a lack of market power. The correct analysis will be to compare the current price with a competitive price for the product or service in question. The consequential problem for courts and regulators is to determine what a competitive price might be for the sake of comparison. The Cellophane Fallacy, if repeated, will permit a product or service provider to avoid being considered to have SMP when, in fact, it does.

To overcome the risk of committing a similar Fallacy, regulators might compare price levels to those that have been achieved for the same or similar products and services in competitive markets in comparable countries. Alternatively, regulators might examine the underlying costs that have been achieved by efficient operators in competitive markets or which could be achieved by efficient operators in the relevant market in question. Neither of these approaches is without difficulty or complexity.

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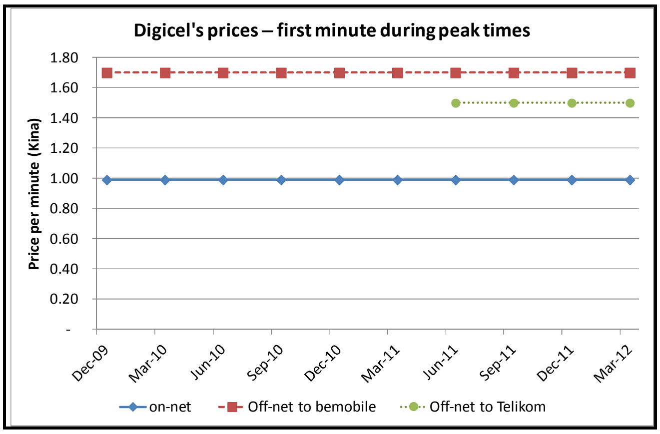
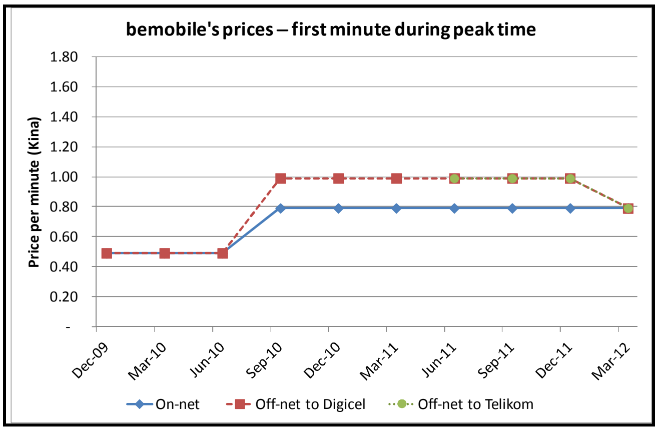
[243] 351 U.S. 377, 76 S.Ct. 994, 100 L.Ed.1264

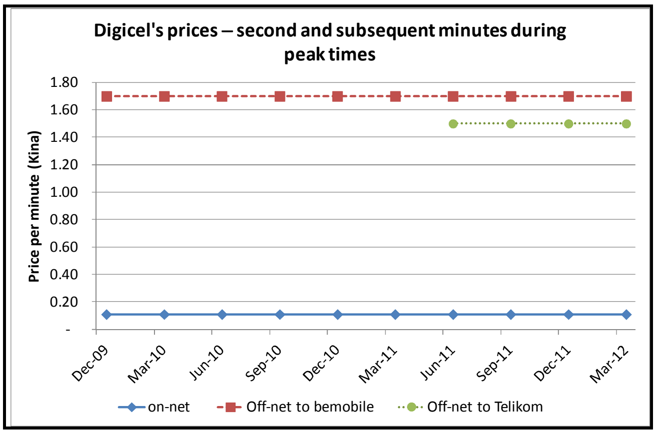
[244] W F Mueller and G W Stocking Snr: “The Cellophane Case and the New Competition”, The American Economic Review, Vol. 45, No. 1 (March 1955), pp. 29-63

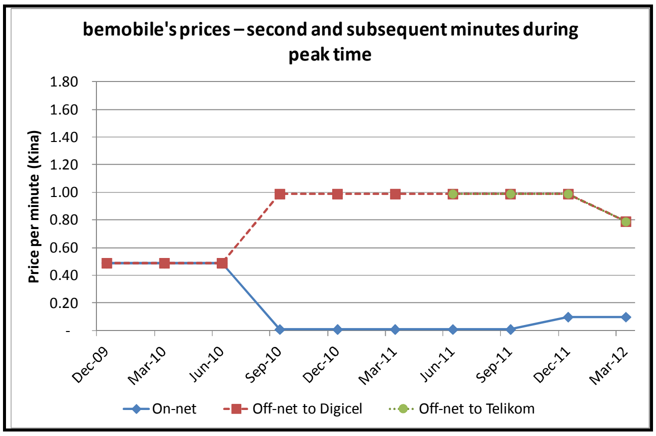
Annex B: Per minute price trends, 2009–2012

Peak times, pre-paid

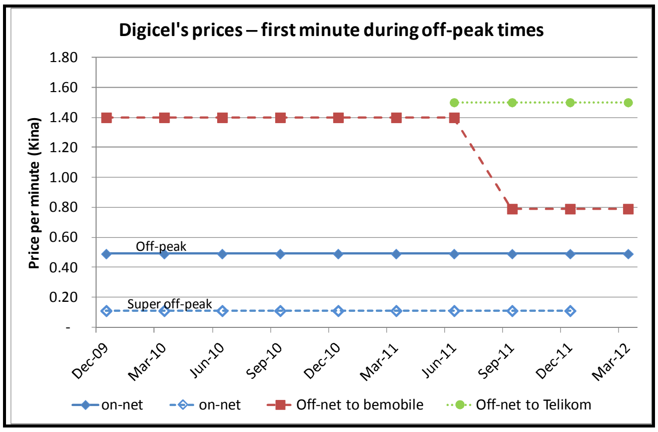


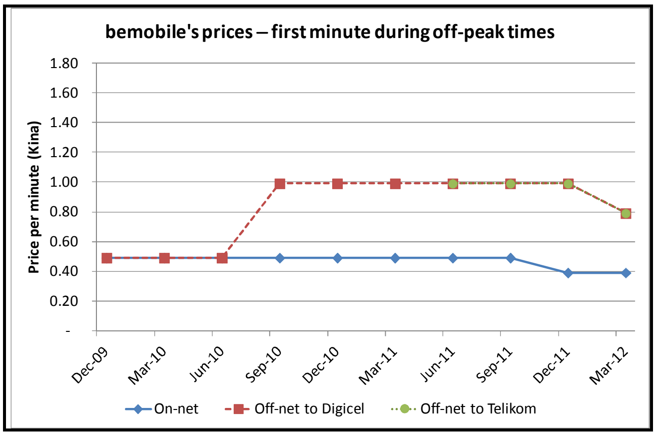


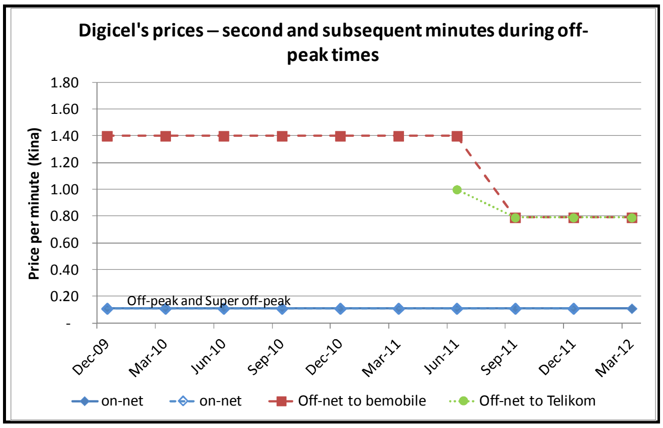


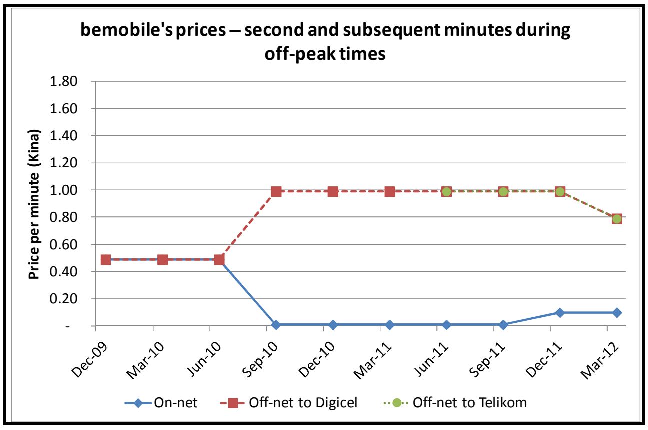


Off-peak times, pre-paid









Annex C: Draft retail service determination

Retail Service Determination No. 1 of 2012

1. Name of Determination

(1) This determination is Retail Service Determination No. 1 of 2012.

2. Preliminary

(1) This Determination is made by the Minister pursuant to his powers and responsibilities under Section 160 of the *National Information and Communications Technology Act 2009*.

3. Commencement and Termination

(1) This Determination commences 30 calendar days after the date on which it is notified in the National Gazette.

(2) That date this Determination commences shall be the Commencement Date.

(3) This Determination shall terminate on the day before the fifth anniversary of the Commencement Date unless terminated before that date in accordance with the revocation processes described in Section 160 of the Act.

4. Interpretation

(1) In this Determination, unless the contrary intention appears:

“Act” means the *National Information and Communications Technology Act, 2009* and includes any regulations made under that Act;

“Digicel” means Digicel (PNG) Limited;

(2) Each of the following terms used in this Determination has the meaning given to it by the Act:

- fixed network
- mobile network
- network
- price
- retail service

5. Application

(1) This Determination applies to the supply by Digicel of mobile originated retail national voice call services that are supplied on a pre-paid basis.

(2) For the avoidance of doubt, the service described in 5(1) is a retail service.

6. Pricing principle

(1) In pricing the services to which this Determination relates, Digicel shall not price discriminate on the basis of the mobile network (including its own) that will terminate the call except to the extent that any such differences are objectively justifiable based on differences in the costs of supplying that service.

(2) For the purposes of clause 6(1) only differences in cost that have been subject to assessment and approval by NICTA shall be accepted as 'objectively justified'.

(3) For the avoidance of doubt, Digicel may not begin charging prices that discriminate on the basis described in clause 6(1) unless and until NICTA has assessed and approved the costs differences for the purposes of this determination as described in clause 6(2).

7. Provision of information to NICTA

(1) Within two weeks of the end of each quarter, Digicel shall submit to NICTA information that shows:

(a) the total number of national call minutes that originated on Digicel's mobile network during each calendar month of the quarter; and

(b) the proportion of those minutes that terminated on:

(i) the mobile network operated by Digicel;

(ii) the mobile network operated by bemobile (PNG) limited;

(iii) the mobile network operated by Telikom PNG Limited; and

(iv) the fixed network operated by Telikom PNG Limited.

(2) NICTA may specify the format or manner in which Digicel shall supply this information.