MARKET ANALYSIS GUIDELINES

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1. Introduction

1.1 These guidelines have been made by the National Information and Communications Technology Authority (NICTA) under section 218 of the National Information and Communications Technology Act 2009 (the Act) to explain how NICTA will define ICT service markets and assess competition within those markets. NICTA intends to follow these Guidelines when undertaking a market analysis process. However, on occasion circumstances may arise that warrant NICTA adopting a different approach. If such circumstances arise NICTA may depart from the approach reflected in these Guidelines and will explain in writing its reasons for doing so.

1.2 NICTA may need to undertake such market analyses as part of its administration of, for example:

- Part VI of the Act, as part of a public inquiry into the potential declaration, or continued declaration, of a wholesale service;
- Part VII of the Act, as part of a public inquiry into the potential introduction, or continuation of, a retail service determination; or
- Section 52 of the Act, as part of a decision on whether or not to consent to the transfer of an operator licence.

1.3 This Guideline is concerned with the way in which NICTA defines and analyses ICT markets in the performance of its functions and the discharge of its duties under the Act in relation to the regulation of the sector on an ex ante basis. It does not extend to cover the way in which NICTA determines whether or not a specific form of regulatory intervention should be introduced if a market is found to be characterised by substantial market power as the criteria on which such decisions must be based are already set out in the Act.

1.4 In performing its functions under Parts VI and VII and Section 52 of the Act, NICTA works in close cooperation with the Independent Consumer and Competition Commission (ICCC), which has responsibility for the administration of the *Independent Consumer and Competition Commission Act 2002* (ICCC ACT) in the general economy, to ensure the consistent application of the common principles that underpin both laws.

2. What is a market analysis?

2.1 Market analysis in this context refers to a formal analysis of the demand and supply and structural factors prevailing in a particular market for the purpose of determining whether or not that market is effectively competitive or, alternatively, whether one or more suppliers in that market has a substantial degree of power such that they may act in the market without the need to be unduly concerned about the response of competitors, customers or consumers.

2.2 The concept of "substantial degree of power in a market" is not defined in the Act. NICTA's view of its meaning in practice is summarised in Figure 1.

Figure 1: What is a substantial degree of power in a market?

As the concept of a substantial degree of power in a market is not defined in the Act, NICTA has considered the usual meaning of that concept in the relevant literature, including the literature on market dominance and the equivalent (or near equivalent) concepts in other jurisdictions.

In an effectively competitive market licensees would be constrained by each other and by customers. Each licensee would know that if it increases prices or reduces output it will lose customers to competitors and will sustain commercial damage as a result. However, if a licensee has a substantial degree of power in a market it knows that those constraints either do not apply or will apply only if the decisions involve very large changes in price or production. Thus a substantial degree of power in a market is typically defined as having a position of such strength in a particular market that the licensee is able to act to a significant extent independently of its competitors and its customers.

In Australia, which uses the same concept and term in the *Competition and Consumer Act 2010,* market power is taken to mean the ability of a firm to act without competitive constraint. Such market power may be evidenced by the ability to:

- raise prices to supra-competitive levels for a non-transitory period of time without its rivals taking away customers;
- withhold supply; and
- determine non-price terms and conditions.

'Substantial' is taken to mean something 'considerable' or 'large' but less than 'commanding a market' or a 'monopoly'. A company may also be found to have a substantial degree of market power even if it does not substantially control the market or have absolute freedom from constraint by the conduct of competitors, suppliers and customers.

In the European Union, the equivalent concept is referred to as significant market power. *Directive 2002/21/EC of the European Parliament and of the Council of 7 March 2002 on a common regulatory framework for electronic communications networks and services* states that a company 'shall be deemed to have significant market power if, either individually or jointly with others, it enjoys a position equivalent to dominance, that is to say a position of economic strength affording it the power to behave to an appreciable extent independently of competitors, customers and ultimately consumers'.

It is neither illegal nor necessarily problematic for a licensee to have a substantial degree of power in a market. Nor is it unlawful to acquire it through competition on the merits. However, conduct that may be pro-competitive (or competitively neutral) when performed by a licensee that does not have a substantial degree of power in a market may be anti-competitive when performed by a licensee that has does.

3. Why might a market analysis be necessary?

3.1 Section 3 of the Act states Parliament's intention that the ICT industry in Papua New Guinea be regulated in a manner that recognises (among other things):

> 'the effectiveness of market forces in promoting consumer welfare, specifically that –
>
> (i) to the extent that markets are competitive, primary reliance should be placed on commercial negotiations and the greatest practicable use of industry self-regulation, subject to minimum regulatory requirements consistent with the objectives of [the Act]; and
>
> (ii) to the extent that markets are not competitive, appropriate *ex-ante* regulatory measures may be required to promote and maintain effective and sustainable competition'.

3.2 The concept of market used here is of a market for the purposes of competitive analysis. This is to be distinguished from popular concepts of markets which are defined for typically commercial purposes relating to improving the level or value of transactions. The first might be considered to be a "competition market" (that is, for competitive analysis) and the second as an "economic market" to assist participants to achieve their commercial and economic goals.

3.3 Whether or not a particular market is effectively competitive, or through the continuation of apparent development will likely become effectively competitive in the near term, is thus a general threshold test for determining whether regulatory intervention (or its continuation) is necessary and appropriate. Particular types of regulatory interventions must pass specific threshold tests. For example, before NICTA may recommend the declaration of a wholesale service under section 129 of the Act, NICTA must be satisfied that the declaration criteria set out in section 128 of the Act would be met by the proposed declaration. Similarly, before NICTA may recommend the making of a retail service determination under section 159 of the Act it must be satisfied that the retail regulation criteria set out in section 158 of the Act would be met by the proposed regulation. Those specific threshold tests are intended to ensure that the regulatory obligations that are able to be imposed under Parts VI and VII of the Act are only introduced (or continued) where NICTA is satisfied that doing so will 'promote effective competition in markets for ICT services'. Indeed the promotion of effective competition is a key objective of both Parts VI and VII of the Act. Section 124 of the Act states that:

> 'The objective of this Part [VI] and Part VII of [the] 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".'

3.4 As the competition objective is 'subject to' the efficiency objective, the Act gives greater weight to ensuring efficient infrastructure investments above greater competition for its own sake.

3.5 "Effective competition" is not defined in the Act. In Section 45(1) of the ICCC Act "competition" is defined for the purposes of Part VI of that Act (dealing with Competitive Market Conduct) as meaning "workable or effective competition, including competition from imports and exports". The term "effective competition" is not further defined or elaborated upon.

3.6 There is no single concept or benchmark that defines "effective competition" in economic theory. It describes the extent of competition, which is different to (and is the outcome of) the process of competition, and refers to the rivalrous behaviours of suppliers in a market that may affect the price or quality or conditions of sale of goods and services. Effective competition is generally taken to mean that firms in a market should be subject to a reasonable degree of competitive constraint from actual and potential competitors as well as from customers. In short, an effectively competitive market is one where outcomes are determined by market forces and not by individual competitors or by agreements or understandings between competitors. One famous formulation stems from the United States:

> 'The basic characteristic of effective competition in the economic sense is that no one seller, and no group of sellers acting in concert, has the power to choose its level of profits by giving less and charging more. Where there is workable competition, rival sellers, whether existing competitors or new or potential entrants into the field, would keep this power in check by offering or threatening to offer effective inducements.'[1]

3.7 Because the ICCC Act was heavily influenced by the concepts in Australian law and by the Australian *Trade Practices Act, 1974* in particular, it is appropriate that NICTA should have special regard to the way in which the concept has developed in Australian law. In Australia, the Australian Competition and Consumer Commission (ACCC) considers[2] that effective competition:

- is more than the mere threat of competition—it requires that competitors be active in the market, holding a reasonably sustainable market position;

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[1] US Attorney General, Department of Justice, 1955, Report of the Attorney General's National Committee to Study the Anti-trust laws (1955), Report, Washington DC, US Government Printing Office

[2] Application by Chime Communications Pty Ltd (No 2) [2009] ACompT 2 (27 May 2009)

- requires that, over the long run, prices are determined by underlying costs rather than the existence of market power;
- requires that barriers to entry are sufficiently low and that the use of market power will be competed away in the long run, so that any degree of market power is only transitory;
- requires that there be independent rivalry in all dimensions of the price/product/service package; and
- does not preclude one party holding a degree of market power from time to time, but that power should pose no significant risk to present and future competition.

This is quite consistent with the American commentary previously cited.

3.8 A market analysis process is one way that NICTA can understand the structure and competitive conditions of a relevant market, assess the extent of competition in it, and form a view as to whether or not that market is, or tending towards being, effectively competitive. Typically this would provide relevant context for NICTA's consideration of a potential regulatory intervention, such as the declaration of a wholesale service or the introduction of a retail service determination. In neither case would the market analysis process replace or supplant the specific threshold tests that the Act requires to be met before such interventions may be recommended to the Minister. Instead NICTA will typically use a market analysis as a filtering process to inform its decision as to whether or not it would be appropriate to contemplate making a regulatory intervention of the types provided for under Parts VI and VII of the Act.

3.9 NICTA believes it is important to know whether or not a relevant market (or part thereof) is effectively competitive or tending that way before it contemplates the declaration of a wholesale service against the statutory declaration criteria. For example, if a downstream retail market is already effectively competitive or tending that way, then the need for any wholesale service in the upstream wholesale market to be made a declared service would be diminished, regardless of any demand or desire that may exist for that declared service. Subsection 128(b)(i) of the Act precludes a wholesale service being made a declared service unless doing so 'is necessary for the promotion of effective competition in at least one market other than the market for the wholesale service'. Similarly, NICTA also believes it is important to know whether or not a market (or part thereof) is effectively competitive or tending that way before contemplating the making of a retail service determination against the statutory retail regulation criteria. If a retail market is already effectively competitive or tending that way, then the need to subject any supplier in that market to a retail service determination would be diminished.

3.10 As NICTA considers the outcomes of a market analysis to be relevant context and thus relevant to the matters under consideration in an inquiry under either section 127 or 157 of the Act, NICTA will typically set out its market analysis and any findings and conclusions it proposes to draw from it in the associated discussion papers published pursuant to section 232 of the Act.

4. Defining a relevant market

4.1 A market analysis process begins with the definition of a relevant market, that is, the field of rivalry in which competition is occurring. The scope or boundaries of any market, defined for competitive market analysis purposes, is determined by the limits of substitutability of supply and demand. In practice, substitutability may best be analysed in terms of three dimensions to the definition of a market for the purposes of a market analysis process: customer, product/service, and geography. Other dimensions may be useful in the case of particular markets, although the discussion here will focus on these three dimensions.[3]

4.2 The customer dimension defines a market in terms of a group of consumers that have a common set of requirements that are satisfied by services/products. Distinct sub-sets of consumers may be identifiable because they have different service requirements, because they are served through different channels, or because price discrimination can be observed. NICTA expects that it will typically be possible to distinguish between wholesale and retail customers for these reasons. It is important not to confuse the market analysis requirements in relation to customers with the segmentation processes that are used for the purposes of developing and implementing sales and marketing processes. Market analysis is about assessing markets for competition regulation, whereas segmentation is about achieving sales and marketing commercial outcomes. Sales and marketing professionals seek to segment the market for their products and services so that they can understand the characteristics of the population segment, their lifestyle and other preferences, and also how they might be effectively reached and communicated with. Market analysis is not about improving commercial effectiveness in the market place. It is about understanding the economics and structure of individual markets for the purposes of ex-ante regulation of market power and of ex-post competition regulation.

4.3 The product/service dimension defines a market in terms of the products and/or services that are offered to satisfy those consumer objectives. This dimension consists of all the products/services that customers perceive as being substitutable for each another because they have equivalent characteristics, functionality, pricing or uses.

For example, if customers perceive calls made from fixed telecommunications services as substitutable for calls made from mobile services, then that supports the conclusion that both types of calls are in the same market. As noted above, whether they are substitutes will depend not only on the physical characteristics of the call (volume, delay, interference, and so on) but also on the importance attached to the personal

[3] For example, within the wholesale/retail dimension (which is part of the customer dimension) it may be useful to examine vertical markets and the supply or value chains that define specific sub-markets within wholesale or retail.

nature of mobile calling, the importance attached to being able to make and receive calls whilst moving, and the price relativities involved.

4.4 The geographic dimension defines a market in terms of the common location in which exists both the consumers' objectives and the products/services intended to meet those objectives. Geographic considerations are important for determining the limits of substitutability of both supply and demand. Traditionally the value and the nature of the goods and services would significantly determine how far afield customers might go to source goods and services and how far afield firms might go to supply or deliver them. The geographic dimension of markets is significantly changing with electronic commerce and payment systems, particularly those accessed by the public internet. Within telecommunications regulation there is a general pre-disposition to define markets as national unless there are demonstrable regional variations in supply or demand.[4] When defining ICT service markets in PNG, NICTA intends to adopt the rebuttable presumption that all telecommunications markets are national in scope unless there is clear evidence to the contrary, such as regional variations in pricing, the availability of particular products/services or barriers to entry.

An example of clear evidence to the contrary might occur in the case of retail fixed broadband markets where the circumstances of network rollout and choice of service provider requires the market to be considered on a sub-market or regional basis. The licensing and service/price offers of the service provider with a substantial degree of power in the relevant market might be national, but the circumstances of competition might well vary with the presence of satellite, cable and other broadband services at a regional or local level.

4.5 The boundaries of a market are determined by identifying the constraints on the price-setting behaviour of competing suppliers. Those pricing constraints largely stem from the potential for one product/service to be substituted for another. Such substitution may occur on the demand-side or on the supply-side. Demand-side substitution considers the extent to which the prices of a particular product/service (or set) are constrained by the availability of other products/service that consumers may use as a substitute. Supply-side substitution considers the extent to which the price of a product/service is constrained by the ability of an actual or potential supplier to switch to the production of the relevant or a substitutable product/service in the short term in response to an increase in its price (without incurring significant additional costs or risk).

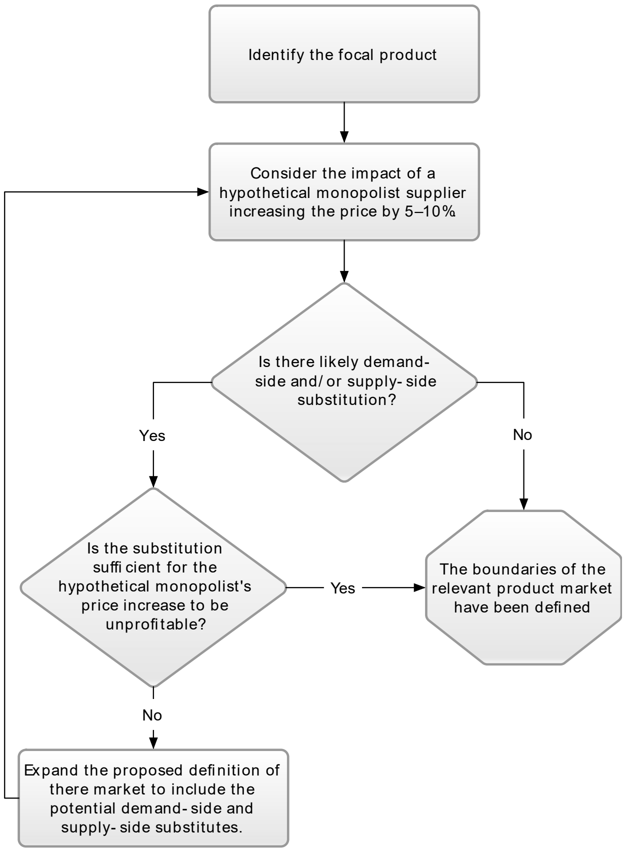
For example, a mobile operator may have established a substantial transmission network connecting its various mobile network nodes (switches, base stations, base station controllers, gateways, points of interconnection, billing, home location system,

[4] See for example the Explanatory Note accompanying the European Commission Recommendation on Relevant Product and Service Markets, SEC(2007) 1483, p.12. That Note appeared at an earlier time in the development of electronic delivery and payment systems, and has been reinforced by further developments since then.

etc). If it has ample capacity on main routes it could readily enter the wholesale and possible retail transmission and leased line markets. This is so because integrated fixed and mobile network operators typically use common network platforms to support provision of fixed and mobile services. In this case, the mobile operator would only contribute to potential supply-side substitution if its licence conditions permitted.

4.6 To determine the nature and extent of demand-side and supply-side substitution, NICTA will undertake quantitative and qualitative analysis, depending on the availability of data and of the resources/specialist capabilities needed to do so. This will be done using the framework of the hypothetical monopolist test (HMT, also known as the small but significant non-transitory increase in the price test SSNIP). The HMT begins by identifying a focal product—typically the most narrowly-defined product that is obviously in the named market—and then considers the potential behaviour of customers and suppliers if a hypothetical monopolist supplier of that focal product imposed a small but significant non-transitory increase in the price of that focal product. Depending on the circumstances, the focal product might be identified in any formal request received from the Minister or another person under section 127 of the Act or by NICTA in the terms of reference for the inquiry. If it is concluded that the SSNIP would be profitable for the hypothetical monopolist supplier—that is, it would not lose sales to such a degree as to make the exercise unprofitable—then this will be evidence of the absence of appropriate substitutes and the focal product or service can be considered to constitute its own separate market. For example, if the focal service is national calls from a fixed location, and the SSNIP would not be profitable because of migration of customers to calls from mobile services, then the substitution is sufficiently significant for mobile calls to be considered part of the market. If the SSNIP in this case was profitable, then the market could be defined as national calls from a fixed location. Whether or not the SSNIP would be considered to be profitable will depend on the number of users of the focal product that move to a substitute product/service and/or the extent to which alternative suppliers are encouraged to enter the market. If it is concluded that the SSNIP would be unprofitable because users of the focal product would switch to other products, and/or because suppliers of other products would begin to compete with the hypothetical monopolist, then the boundaries of the market will be expanded to include those substitute products. The exercise would then be repeated by imagining that a hypothetical monopolist supplier of the expanded set of products (i.e. the focal product and its identified substitutes) imposed a SSNIP for that expanded set of products. This process would continue to be repeated until the point is reached where it is concluded that a SSNIP would likely be profitable. At that point the potential for demand-side and supply-side substitution is exhausted and the range of products that comprise the market have been identified, thus defining the boundaries of the market. The process is summarised in Figure 2.

Figure 2: Summary of the HMT process



4.7 A SSNIP will be considered to be a price increase of between 5–10% or more that lasts for at least one year. At the same time, it will be assumed that all the terms and conditions of supply for the potential substitute products remain unchanged.

4.8 NICTA will examine possible demand-side substitution before considering the potential for supply-side substitution. To determine whether, or the extent to which, a particular product/service is a demand-side substitute for another, NICTA will consider (among other things):

(a) relative price levels and the extent to which users may choose one product/service over another in response to changes in these relative prices levels;

(b) the quality of service of the relevant products/services, including technical capabilities;

(c) the perception of customers, or potential customers, as to the degree of substitutability of the relevant products/services;

(d) historic and forecast trends in the demand (including penetration rates) of the relevant products/services;

(e) the contract duration, if any, of the relevant products/services;

(f) the switching costs relative to the value of the product/service under examination;

(g) the effects of bundling, if any.

4.9 NICTA's analysis of the potential for supply-side substitution will focus on possible substitution from products/services that have not already been included in the definition of the market as a result of NICTA's consideration of demand-side substitution.

4.10 To determine whether, or the extent to which, there is potential supply-side substitution, NICTA will consider (among other things):

(a) whether another supplier (including a potential new entrant) would be able to switch to the production of the relevant product/service within a period of one year through the redeployment of existing capacity or through an expansion of its production (both of which could involve small levels of investment);

(b) whether that alterative supplier would incur significant sunk costs relative to the return that it would likely be able to earn;

(c) evidence of previous entry into the relevant market by a new entrant.

4.11 In addition, where the information is available NICTA will also consider (among other things):

(a) information from existing suppliers or potential new entrants regarding their ability to switch production, the likely costs of doing so, and the amount of time it would take to do so; and

(b) evidence of existing suppliers having spare capacity.

4.12 It is likely that much of NICTA's analysis within the framework of the HMT will be qualitative rather than quantitative. This is because NICTA does not have key quantitative data, such as price elasticity of demand at current price levels. However in such circumstances NICTA will seek to obtain proxy or next best information in order to better understand where the boundaries of profitable substitution might be in specific cases.

4.13 In applying the HMT NICTA would also need to able to ensure that current prices of various products and services are competitive prices; that is, that they are the prices that would be set by a competitive market. It would need to do this to avoid the Cellophane Fallacy in its assessment (explained in Figure 3**Figure** 3).

Figure 3: The Cellophane Fallacy

4.14 It is possible that separate markets defined by NICTA will include common products/services; that is, it is possible that particular products/services may be identified as being with multiple markets simultaneously. This may happen if there is substantial substitutability between the services in question.

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.[1] 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. 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 it is possible to compare price levels to those that have been achieved for the same or similar products and services in competitive markets in comparable countries. Alternatively, it may be possible to 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.

For example, it is possible that NICTA might define a retail market for mobile services generally that includes all of the individual applications that are sold as part of the mobile "bundle", including mobile voice service. It is also possible NICTA might define a different market for national voice services covering voice calls made from both fixed locations and via cellular mobile handsets. In such a case mobile voice is in both markets as defined. This will not constitute a problem for market analysis and for regulatory intervention. However, most regulators would prefer to avoid having the same service in more than one market for administrative "neatness". This preference has no basis in competition regulation, and possibly derives from an earlier view that each service has a unique place in any market categorisation.

4.15 Where products/services are supplied in a bundle, NICTA may find that the bundle constitutes a product or service in its own right even though the individual products/services that make up the bundle may not be substitutes for one another. In such circumstances NICTA will take account of the demand-side and supply-side substitutability of both the bundle as a whole and its individual components.

An example would be a retail mobile service bundled offering that included voice minutes, data capacity and messaging (SMS/MMS). Within this bundled offering, messaging applications may be a part-substitute for voice under certain conditions. It is probably more accurate to characterise messaging as a complementary service to voice. With that partial exception the three components of the bundle are not substitutes for each other. However they are conveniently provided using the same network platform.

4.16 The definitions (i.e. boundaries of supply and demand substitution) of a market may change over time as substitution changes and evolves as a result of, for example, changes in technology or user expectations or requirements. These changes are sometimes the result of convergence at many levels, as in ICT markets generally. Consequentially, NICTA will not be disposed to rely on market definitions that are more than two years old without explicitly re-examining the assumptions underlying the definitions in question. ICT markets are particularly dynamic and changing because of, amongst other factors, changes in the underlying technologies which are rapidly evolving; globalisation; changing costs levels and relationships; changing patterns of demand; innovation and creativity in the development of new services; and changing value and supply chains resulting in the emergence of new participants in markets. In any case, NICTA will review its market definitions (and the conclusions based on them) regularly.

5. Is the market suitable for ex-ante regulatory intervention?

5.1 Following the definition of a relevant market, NICTA intends to use the so-call three criteria test (3CT) to help it determine whether that market should, in principle, be subject to ex-ante regulatory intervention of the types provided for in Parts VI and VII of the Act. (In the case of a market analysis process that is part of an inquiry for the purposes of section 127 of the Act, NICTA will apply the 3CT to both the relevant wholesale market and one or more of the downstream retail markets.) Under the 3CT a market is considered to be suitable for ex-ante regulation if:

1. the market shows high and non-transitory barriers to entry, <u>and</u>
2. market structures do not tend towards effective competition in a relevant time horizon; <u>and</u>
3. the ex-post application of competition law alone would not adequately address the market failure in a suitable timeframe.

5.2 With respect to the first criterion, there are a number of different types of potential barriers to entry into a market that may exist and which NICTA will seek to identify, assess and, if possible, quantify:

- Absolute barriers exist where certain firms own, have access to, or are granted privileged use of important assets or resources which are not similarly accessible to potential entrants.[5] For example, if important rights of way have been granted to an incumbent fixed operator, or preferred spectrum resources have been granted to an incumbent mobile operator, and the available resources for potential entrants are inferior in both cases, then absolute barriers to entry have been created. These barriers might be dismantled with difficulty, but, until then, they are effective in making later market entry extremely difficult.
- Structural barriers to entry result from original cost or demand conditions that create asymmetric conditions between existing marker participants and new entrants and thereby impede or prevent the 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;
- Legal or regulatory barriers are those that result from legislative, administrative or other government measures that have a direct effect on the conditions of entry and/or the positioning of operators on the relevant market.[6]
- Strategic barriers arise due to the strategic behaviour of existing market players, for example through pricing behaviour or through non-price behaviour (such as

[5] 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

[6] Ibid

increased investment, promotion and distribution).[7] For instance, if in anticipation of potential new entry, an incumbent operator reduces prices generally or provides incentives for larger customers to take long-term service contracts, this is regarded as strategic behaviour because it changes the terms of competition and makes it harder for potential entrants to gain market traction.

5.3 NICTA's analysis will tend to focus on indicators of barriers to entry that exist in the absence of any existing regulation, such as the extent of any sunk costs, the market structure, market performance and market dynamics. This will involve analysis of indicators such as market shares and trends, market prices and trends, and the extent and coverage of competing networks or infrastructure.

5.4 If NICTA considers that a market satisfies the first criterion (in paragraph 5.1), NICTA will assess the market against the second criterion. NICTA's analysis will examine the structural characteristics of the relevant market and consider whether such characteristics are likely to enable the market to become, or remain, effectively competitive over a forward-looking period of 2–3 years. The period of 2–3 years is considered generally appropriate given the fast changing nature of the ICT industry.

5.5 If NICTA considers that a market satisfies the second criterion, NICTA will assess the market against the third criterion. NICTA's analysis will identify the potential competition problems that might arise given the characteristics of the market and the conditions of competition identified through its analysis of the first two criteria and consider whether, given the nature of those potential problems, it would be sufficient and appropriate for those problems to be addressed reactively by the ICCC under the ICCC Act in the event that they arise or are alleged. As part of its consideration NICTA may seek the ICCC's opinion on this aspect.

5.6 If a market fulfils all three criteria it does not automatically mean that ex-ante regulation is necessary in the relevant market. NICTA may still forbear from regulatory intervention and may decide instead to monitor how the market develops. This may well be advisable where a market is embryonic and regulatory intervention at too early a stage risks significant market distortion. In such cases the regulation of any competition problems that may arise in those particular markets would be left to ex-post regulatory intervention, where necessary, by the ICCC under the ICCC Act, with the assistance of NICTA as appropriate.

5.7 If NICTA finds that a particular market does not satisfy all three criteria then it is likely that ex-ante regulatory intervention on competition grounds would not be appropriate and NICTA would be inclined to refrain from considering regulatory intervention of the types provided for under Parts VI and VII of the Act. NICTA would otherwise continue its inquiry and consider the potential declaration of a wholesale service against the

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

statutory declaration criteria, but it would be substantially assisted in the expedition of that inquiry by its 3CT analysis of the relevant wholesale market, and/or the relevant downstream retail markets. Similarly, NICTA would be assisted in the expeditious completion of whether it should make a retail service determination against the statutory retail regulation criteria if the relevant retail market did not pass the 3CT.

5.8 The use of this 3CT is a requirement of the regulatory framework for electronic communications in the European Union and has since been adopted by many regulators outside of Europe, particularly in the Middle East. Although the use of the 3CT is not a statutory requirement in PNG, NICTA considers it to be a regulatory best practice and an important filter for determining whether or not a market is suitable for ex-ante regulatory intervention. NICTA also believes that applying the 3CT as part of its market analysis process will help NICTA further minimise the costs associated with regulatory error; that is, the efficiency costs of incorrect decisions on whether or not to intervene in a market. When deciding whether to intervene NICTA must weigh the efficiency costs of potentially identifying and regulating a market failure that does not actually exist against the costs of failing to identify and regulate an actual market failure. By applying the filter of the 3CT, NICTA intends to ensure that any ex-ante regulatory intervention of the types provided for under Parts VI and VII of the Act are limited to circumstances where such intervention is necessary. NICTA considers this highly appropriate given the potential costs of regulatory error. The threshold tests required by the Act (namely, the requirement that NICTA must satisfy itself that any recommended interventions satisfy either the Declaration Criteria or the Retail Regulation Criteria, as the circumstances require) serve to ensure that such interventions are justified on specific economic considerations that ensure consistency with the objectives of Parts VI and VII of the Act. NICTA's use of the 3CT is intended to provide a supplementary (and not an alternative) process that is consistent with the promotion of the objectives of Parts VI and VII of the Act and ensures that potential interventions are only considered in markets that are suitable candidates for ex-ante regulation.

5.9 NICTA's conclusions as to whether a particular market satisfies one or more of the three criteria may change over time as the conditions and dynamics of the market evolve, particularly as a result of technological innovations and the development of alternative ways of supplying ICT services.

6. Market analysis

6.1 If a defined market satisfies the 3CT, NICTA will proceed to analyse the effectiveness of competition in that market and whether there are any licensees with a substantial degree of power in that market. A licensee must be found to have a substantial degree of power in a relevant market before NICTA may recommend the making of a Retail Service Determination to the Minister (see paragraph 158(b)(i) of the Act). Although the Act does not require an equivalent finding in order for NICTA to recommend the declaration of a wholesale service, the analysis involved in identifying market power (if any) will provide NICTA with relevant insights into the effectiveness of competition in the relevant markets. Such insights are relevant to NICTA's consideration of a proposed declaration against the declaration criteria, two of which relate to the promotion of effective competition (see paragraphs 128(a–b) of the Act). A finding that a licensee has a substantial degree of power in a market means that that market is not considered to be effectively competitive. The concepts of effective competition and a substantial degree of power are antithetical, even though some market power (less than a substantial degree) may be consistent with effective competition.

6.2 As NICTA does not expect to have the data on prices and costs necessary to perform a direct measurement of a licensee's level of market power (that is, by applying a Lerner Index type approach), NICTA will use the indirect method of analysing a market for the purpose of determining whether any participant in that market has a substantial degree of power. The tables below list the main criteria that NICTA will consider when doing so. They are not a comprehensive list of all possible criteria but shows the types of evidence that NICTA will take into consideration. A substantial degree of power in a market may be found to derive from any combination of the criteria even though when taken separately they may not be sufficient to reach a conclusion one way or the other. Further, the criteria may not all point in the same direction so that often NICTA will base its conclusions "on balance". As the criteria must be considered in the context of the particular market(s) under analysis, not all criteria will necessarily be relevant to all markets nor necessarily be given the same weight in different market analyses. The implications of findings made under individual criteria may differ according to the findings made under other criteria and the relative importance of criteria may change as evidence emerges through the analytical process/inquiry.

Identification of a single firm with substantial degree of power in a market [8]

Criterion	Implication for assessment of market power
Market shares	Market shares, on their own, are not conclusive of a substantial degree of power in a market. In some jurisdictions—but not PNG—rebuttable presumptions about market power arise at various levels of market share. A high market share, especially in relation to the individual and combined shares of other market participants, is an important indicator that a licensee may have a substantial degree of power. Where markets are emergent or growing more quickly, high market shares are less indicative of market power than in more mature or slow-growth markets. Fluctuations in market shares may also indicate a lack of substantial market power and some evidence that competitive forces are in play. 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 a substantial degree of power in a market. When considering market shares, NICTA may assess the level of market concentration using the Herfindahl-Hirschman Index (HHI), which is calculated by squaring the market share of each competitor in a market and then summing the resulting numbers[9]. 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. Although a HHI measure of 1,800 is commonly interpreted internationally as an indication of a highly concentrated oligopoly market structure, it is a value that derives from manufacturing industries in the United States and NICTA considers it an inappropriately low threshold for telecommunications markets, which tend toward oligopoly.
Control of infrastructure not easily	This 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

[8] This is generally referred to as 'single dominance' in the economic literature.

[9] The HHI is a measure of concentration and provides a result that is proportional to the average market share, weighted by market share. The logic of the squaring of individual shares is to provide a suitable weighting.

Criterion	Implication for assessment of market power
duplicated	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 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 to build in order to provide the service in question. This would be exacerbated where the minimum capacity from the infrastructure exceeds the capability of the competitor and would be commercially unjustified in the short to medium term. 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).
Technological advantages or 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. However, some technological advantages might only be temporary and may therefore not be a permanent source of substantial market power.
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 countervailing buying 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.
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.
Product/service 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.
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 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

Criterion	Implication for assessment of market power
	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.
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.
Vertical integration	Vertical integration means that a firm is operating at both the wholesale and retail levels in a sector or in related markets, and this 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.
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.
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. This criterion is usually most important where the sales and distribution network is exclusive to a firm, and sales and distribution agents are not free to offer competing services.
Barriers to expansion	There may be more active competition where there are lower barriers to growth and expansion. While growth and expansion is generally easier to achieve (particularly for new entrants) in growing markets, it might be

Criterion	Implication for assessment of market power
	inhibited in mature, saturated markets, where customers are already locked in with a certain supplier and have to be induced to switch.
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. (The nature and effect of barriers to entry is also a factor to be considered by the ICCC under section 68(5)(b) of the ICCC Act when determining whether market concentration through merger or acquisition might substantially lessen competition in a market.)
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.
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. It is not practicable to measure switching costs directly as they are largely consumer-specific, reflecting the level of effort required by an individual and thus unable to be calculated from any data. 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. Specific arrangements to facilitate switching need also to be considered in this context, such as number portability in telecommunications service markets.
Excessive pricing	This refers to the ability to price at a level that keeps profits persistently and significantly above the competitive level. In a competitive market,

Criterion	Implication for assessment of market power
and profitability	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 a substantial degree of power in a market it is not a necessary condition for such a finding. 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.
Network effects	Network effects describe the dependence of consumer willingness to pay for a given product or service based on the number of users of that product or service (i.e. on the size of the network). A product or service exhibits network effects when the utility of a user increases with the number of other users consuming it. The presence of network effects can therefore confer market power on firms with high market shares. 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.
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. However, for some services, these considerations are effectively non-existent, leaving competition to be expressed in price terms or not at all. The reverse also applies – even in the absence of price competition, there may be robust competition on other dimensions of service.
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.[10]
The number of buyers and sellers in a	This criterion is set out in Section 60(5)(c) of the ICCC Act, and is a factor that the ICCC would likely consider when determining whether a proposed merger or acquisition might result in a substantial lessening of

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

Criterion	Implication for assessment of market power
market	competition in a market. The same criterion will be considered by NICTA in determining whether there is any licensee with a substantial degree of power in a market. In general terms the more participants in a market, and the less concentrated it is, the less chance there is that the structure will sustain dominance.
The dynamic characteristics of the market, including growth, innovation and product differentiation	These factors are listed in Section 69(5)(g) of the ICCC Act as matters for the ICCC to consider when analysing whether mergers and acquisitions might have the effect of substantially lessening competition in a market. The same considerations will be taken into account by NICTA when considering whether there is any licensee with a substantial degree of power in a market. In general terms, fast growing markets allow opportunities for other competitors to gain traction in markets and to develop specialisations and advantages. Innovation in terms of products and process will change the fundamental terms of a market and may provide greater opportunities for smaller or new competitors to compete effectively compared to the circumstances and opportunities in a more stable market environment. Product differentiation generally means that direct substitution is more difficult and this may also favour smaller, more agile and more creative competitors. The corollary is that stable markets with slower growth and development, and where products and services are more fungible and less differentiated, may be more prone to dominance by one or more competitors. This proposition must be treated with caution and carefully tested against the factual circumstances of particular markets being analysed, because exceptions abound in economic and legal literature.

Collective Market Power (or Collective dominance)[11]

6.3 Collective dominance occurs where two or more firms have a collective position of strength in a market such that they may pursue a common policy in a market without particular regard to the responses of other firms or of customers and consumers. If the pursuit of a common policy in the market is the result of agreement or an understanding then that is unlawful collusive behaviour and may attract criminal as well as regulatory sanctions. If the pursuit of a common policy is the result of conscious parallel behaviour, without explicit agreement between the parties, it may yet be collective dominance.

6.4 NICTA accepts that this is a contentious area of the law in most countries and intends to proceed with exceptional caution if allegations of abuse of collective dominance are raised. Such allegations would be referred to the ICCC to be pursued under the ICCC

[11] This is generally referred to as 'collective dominance' in the economic literature – a term that has now far more general application. As a result it is used in the text in this section of the Guideline.

Act. However circumstances may arise where market structure creates a high risk of collective dominance that may be alleviated or otherwise addressed by ex-ante intervention by NICTA. Also, consideration of the possibility of collective dominance might be appropriate when NICTA is conducting a public inquiry for the purposes of Part VI or VII of the Act. In such circumstances, NICTA will have regard to the following criteria, none of which is determinative of the issue by itself:

(a) Transparency in the market sufficient to give competitors visibility of each other's behaviour and facilitating the development of common policies that lead to collaboration and cooperation rather than to competition between them.

(b) Typically a small number of competitors, which will facilitate cooperation and collaboration. Generally the larger the number of competitors the more difficult it will be to establish and sustain a common purpose.

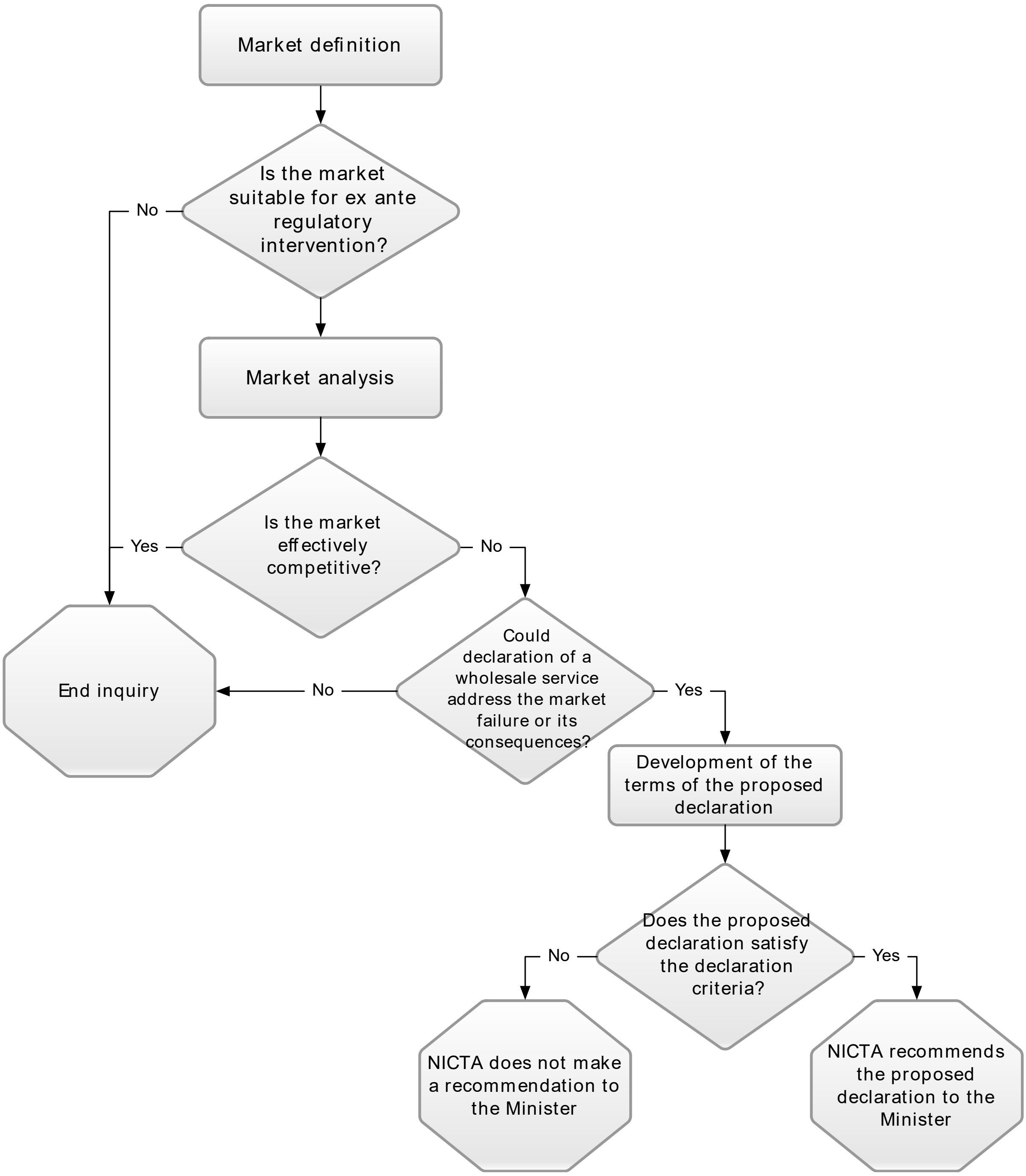
(c) Market characteristics that provide incentive for collaboration or cooperation rather than competition, such as:
   i. Similar cost structures, offering no cost advantage to any competitor;
   ii. Low market growth, including market saturation, suggesting that competing on lower prices will not be offset by new customers and demand; and
   iii. Little technological change resulting in stable cost levels, stable cost relativities, low levels product and service innovation, and settled demand patterns.

(d) Other factors already mentioned in relation to single dominance that might also facilitate or impede collective dominance in a market, such as:
   i. Control of infrastructure not easily duplicated, particularly associated with refusal of access to third party operators;
   ii. Technological advantages or superiority, not available to third party competitors;
   iii. Absence of or low countervailing buying power, which might otherwise disrupt cooperative arrangements between providers;
   iv. A highly developed distribution and sales network, particularly if not available to or replicable by third party competitors;
   v. Ease of market entry;
   vi. Absence of potential competition;
   vii. Switching barriers;
   viii. Excessive pricing and profitability, including the history of price competition in the relevant market;
   ix. Network effects;
   x. Lack of active competition on non-price factors.

(e) The existence of sanctions that could be imposed on an operator that deviates from the common purpose and that are likely to be sufficient to dissuade the operator from such deviation.

A detail market assessment is required to determine whether the market is likely to facilitate collective dominance. The factors set out in (a), (b), (c) and (e) will generally, but not always, facilitate collective dominance. The factors in (d) will need to be individually considered to determine their impact but generally the impact would be the same as for single dominance.

ATTACHMENT A: OVERVIEW OF NICTA'S PROCESS FOR INQUIRIES FOR THE PURPOSES OF SECTION 127 OF THE ACT



ATTACHMENT B: OVERVIEW OF NICTA'S PROCESS FOR INQUIRIES FOR THE PURPOSES OF SECTION 159 OF THE ACT