Determination: Retail Domestic Mobile Telephony Market Definition

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List of Abbreviations

3G/4G	3rd/4th generation mobile communications standards
ARPU	Average revenue per user. This refers to the average revenues, typically monthly, that a service provider earns from its retail customer base, expressed on a per user/customer/connection basis.
CUG	Closed user group. This is a supplementary service provided by the mobile service providers, typically to business customers, offering benefits (e.g., unmetered calls and/or messages) from any member associated within the group.
EC	European Commission
GCC	Gulf Cooperation Council is an alliance of six Middle Eastern countries, namely, Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and the United Arab Emirates (UAE).
ICT	Information and communications technology
LTE	Long Term Evolution, which is the 4G mobile communications standard
MB/GB	Megabyte/gigabyte are measures of data. 1 MB is equivalent to 8 megabits, or 1 million bytes; 1 GB is equivalent to 1 billion bytes.
Mbps	Megabits per second, which is a rate of data transfer
MiFi	A wireless router that provides the functionality of a mobile Wi-Fi hotspot (i.e., access to the Internet for multiple users)
MMS	Multimedia Messaging Service (picture message)
MVNO	A mobile virtual network operator is a mobile service provider that does not own and operate its own end-to-end mobile network infrastructure to service its end users but relies instead on wholesale access to a mobile network operator's physical infrastructure and spectrum.
OECD	The Organisation for Economic Co-operation and Development is an international organisation with 36 member states that collaborate on key global issues.
OTT	Over-the-top services are, typically, mobile applications, such as Skype or WhatsApp, which may offer similar and additional functionality over traditional services and rely on end users' Internet connections.
PAYG	Pay as you go refers to tariffs on which customers top up credit and pay for services as they consume them (i.e., on a per minute/message or MB basis), rather than purchasing, or agreeing to purchase, a set amount of services in advance.

SMB	Small and medium-sized business. Usually an entity with fewer than 100 employees.
SME	Small or medium enterprise
SMS	Short Messaging Service (text message)
SOHO	Small office/home office. A term used to refer to small businesses, many of which operate out of homes
SSNIP	The term "small but significant non-transitory increase in price" refers to a test used in market definition exercises, which aims to estimate the reactions of end users and prospective suppliers to a 5% – 10% price increase, from a hypothetical monopolist, in the focal product under consideration.
TATT	The Telecommunications Authority of Trinidad and Tobago (The Authority).
Wi-Fi	A form of wireless local access network (WLAN) to allow multiple users access to the Internet

Executive Summary

The Telecommunications Authority of Trinidad and Tobago (the Authority) commissioned this determination to review and assess the need to update its definition of the relevant market(s) for retail domestic mobile services in accordance with, the Concession for the Provision of Public Mobile Services. Market definition is an exercise widely conducted throughout many jurisdictions around the world and describes the assessment by which a regulatory or competition authority determines the set of products or services that are considered to be in the same economic market, for the purposes of its assessments, investigations, and interventions. Frontier Economics was engaged by the Authority to determine the relevant economic boundaries of the retail domestic mobile market(s) in Trinidad and Tobago.

Determinations of market definition applied in an ex- ante perspective, provides a useful starting point for ex-post interventions (for example, for merger assessments, investigations into alleged anti-competitive conduct and determinations of market dominance[1]). Market definitions are typically executed by qualitative or quantitative methods or hybrid of both. This market definition exercise was conducted using qualitative and quantitative information, customer survey and quantitative analysis, to discern mobile services consumers' preferences for various prices and non-price factors[2].

[1] This is a generally accepted principle, recognised across many jurisdictions. For example, the European Commission, whose regulation applies to 28 countries, sets this concept out in its Significant Market Power (SMP) Guidelines for the telecommunications sector, which can be found here:

https://ec.europa.eu/digital-single-market/en/news/communication-smp-guidelines

[2] In the absence of sufficient data on price and/ or other variables, qualitative evidence has been relied on in EU case law and the European Commission practice. Particularly, in dealing with zero rated digital commodities, relevant markets were based solely on qualitative evidence on the functionality and uses of the commodities (CORE, 2018).

This document, “Determination: Retail Domestic Mobile Telephony Market Definition” (the Determination) is divided into seven sections. Section 1.2 provides a background statement and a description of the process the Authority has followed to reach its determination. Section 2 highlights the Authority’s approach. Sections 3 to 5 set out the Authority’s market definition assessment, and section 6 presents the Authority’s conclusions.

1. Introduction

1.1. Rationale

In Trinidad and Tobago's retail telecommunications markets, ex-ante price regulation is governed by section 29 of the Telecommunications Act, Chap. 47:31 (the Act) of 2001 and the Authority's draft Price Regulation Framework for Telecommunications Services in Trinidad and Tobago (Price Regulation Framework) , which states that, before any ex-ante price regulation is imposed, the Authority must first identify a market failure in the relevant market, by demonstrating that one or more concessionaires hold(s) a dominant position in a relevant market. This, in turn, requires the Authority to define the boundaries of that market.

In addition to facilitating the introduction of ex-ante price regulation, where appropriate, defined relevant markets may also serve as a reference point for monitoring competitive dynamics in retail markets. For example, during customary monitoring of domestic markets, early identification of potential issues with the functioning of the market may be facilitated and assessed leading to more timely resolution, once the market has been defined[3].

Therefore, having considered recent and likely future market trends in the relevant markets; after careful economic analysis; and after due deliberation the Authority has identified the relevant economic market for retail domestic mobile services. The relevant mobile market reflects that Trinidad and Tobago mobile services consumers perceived mobile voice services are substitutable with mobile data services but establishes boundaries with Fixed Voice, Fixed Broadband and OTT Voice and messaging services.

[3] It is noteworthy that a market defined for ex-ante purposes, will not necessarily also be appropriate in a subsequent ex-post investigation. In said cases the Authority may apply additional customer price and quality sensitivity test (OECD, 2012)

1.2. Background

The Act (amended by Act 17 of 2004), established the Authority as an independent regulator in July 2004. As part of its role, as defined by the Act, the Authority is responsible for regulating the fixed and mobile telecommunications and the broadcasting sectors. Market definitions are applied in several regulatory and competition-related contexts, one of which is to facilitate the imposition of ex-ante price regulation in the retail telecommunications sector.

In the Trinidad and Tobago retail telecommunications markets, ex-ante price regulation is governed by section 29 of the Act. Additionally, the Authority's draft Price Regulation Framework[4] provides guidance on how the Authority should approach its regulatory duties. The Act permits the Authority to impose ex-ante price regulation in cases where the Authority has identified a market failure in the relevant market, by demonstrating that one or more concessionaires hold(s) a dominant position in a relevant market. In turn, this requires the Authority to define the boundaries of that market or use the predetermined markets set out in the *Concession for the Operation of a Public Telecommunications Network and/or Provision of Public Telecommunications and/or Broadcasting Services*[5] (the Concession).

For domestic mobile services, the Concession lists the following market definition: Public Mobile Voice Origination Services (National and Major Territorial). For the purposes of ex-ante price regulation, the draft Price Regulation Framework considers all geographic markets as national in scope, unless there is strong evidence that competitive conditions are not the same across the country.

As an initial step for assessing the need for any ex-ante price regulation, this Determination considers how the predetermined market definition set out above relates to the retail services considered within the context of this analysis. This is followed by a description of the market definition exercise conducted for retail domestic mobile services, confirming the relevant product scope, customer segmentation and geographic scope and considering demand-side and

[4] Available at:

https://tatt.org.tt/Portals/0/documents/Price%20Regulation%20Framework%20for%20Telecommunications%20Services%20FINAL1.pdf

[5] Available at: https://tatt.org.tt/Portals/0/Generic%20Concession%20Document.pdf

supply-side considerations in the context of the telecommunications market in Trinidad and Tobago.

Section 2 describes the Authority's approach to defining the relevant markets. Sections 3 to 5 apply this approach, considering the specific market information and the data consolidated by the Authority.

In reaching this determination, the Authority collated a range of both qualitative and quantitative information for analysis, mostly obtained from the four sources described below:

(a) In July 2018, the Authority issued the following requests for information to all the concessionaires offering fixed and mobile retail telecommunications services in Trinidad and Tobago:

i. Qualitative requests. These asked for concessionaires' views on issues such as market outlooks, consumer preferences/behaviour, and comparability of products.

ii. Quantitative requests. These requests, in the form of templates, asked the concessionaires to provide time-series data on subscribers/end users[6], traffic, revenues and costs, broken down into predetermined subcategories. The data requested covered the period 2014 to 2018. The data would be used to analyse competition in the market over the following 3-5year period depending on the state of change in the mobile market dynamics during said period.

A complete set of definitions was also included with the quantitative data requests, to provide context and requirements for the requested figures, and to ensure consistency across the concessionaires' submissions.

[6] The term "end user" is used where possible throughout the document for consistency. However, this is also used interchangeably with the terms "subscriber" and "customer", where these terms are more appropriate for the context, for example, where the concessionaires refer to end users as subscribers, or the text refers to customer segmentation.

(b) In addition, the Authority commissioned market research firm, Caribbean Market Research (CMR), to undertake a consumer survey titled TATT- *CMR Quantitative Market Research Study: Mobile Retail Services* (TATT-CMR Survey). The survey comprised a sample[7] of 1,000 end users of retail mobile services in Trinidad and Tobago, using a random intercept[8] survey. Respondents were asked about their usage of telecommunications services, covering both their current consumption of such services (volumes and prices paid, as well as the factors they consider most important when making consumption decisions) and their perceived behaviour in the event of changes to the characteristics of those services (for example, whether they would change providers or adjust their usage following changes in prices).

(c) Tariff plan information available on the concessionaires' websites

(d) Market data sourced from the Authority's Annual Market Reports available on its website

In reaching this determination, the Authority has, therefore, considered the responses it received to the information requests, together with other evidence it gathered and analysis it undertook.

[7] The sample of 1,000 respondents is deemed representative of the Trinidad and Tobago population as it effectively captured the market split of 79% prepaid 21% postpaid. Additionally, it also mirrors domestic demographics in respect of gender, location, age and social class.

[8] Under a random intercept approach, the interviewers approach prospective respondents in high-traffic areas to conduct face-to-face interviews (as opposed to telephone interviews or interviews in which the respondents are pre-selected). The random intercept approach is used for its ease of implementation and was considered to be the most appropriate survey methodology. With a sample size of 1,000, the margin of error is 3.1% (source: TATT-CMR Survey presentation).

1.2.1. Status of Data Collated

The concessionaires responded to the information requests, guided by frequent communication from the Authority. Further details were also provided to clarify the format and quantity of data that would be required in order to conduct specific tests.

After the Authority received the last updated responses to data requests from the concessionaires, the data available at the time of preparing this document[9] were consolidated and used as inputs for the analysis.

[9] Qualitative evidence has been relied on in EU case law and the European Commission practice in the absence of sufficient data on price and/ or other variables. Particularly in treating with zero rated digital commodities, relevant markets were established solely on qualitative evidence, including the functionality and/ or uses of the services (CORE, 2018)

1.3. Purpose

For the purpose of price regulation as may be necessary, the Authority has outlined the following market definitions, within the draft "Price Regulation Framework for Telecommunications Services for Trinidad and Tobago" in respect of the domestic retail mobile markets:

i. Voice Services Origination

ii. Voice Services Termination

iii. Messaging Services

iv. Narrowband Internet

v. Broadband Internet

vi. Roaming

The Authority finds it prudent to perform an updated review of the relevant boundaries of the domestic retail mobile markets. This review is undertaken regarding the following:

i. the notable price increases observed in the domestic retail mobile market;
ii. the overall importance of the mobile market to the overall telecommunications sector's sustainability and the development of the national economy;
iii. global developments in technology which may hold the potential to affect domestic mobile markets;
iv. changes in various market share indicators and the sector's general level of duopoly competitiveness; and
v. changes in consumer usage patterns

1.4. Legislative Basis

In accordance with the legal mandate of the Authority which emphasises the establishment of conditions for an open market which promotes fair competition, the Authority is obligated to appropriately define and assess markets for conditions of unfair competition including dominance.

In respect of price regulation, the Authority is empowered to regulate the prices of telecommunications services provided by dominant operators, in accordance with sections 29 (2) and 29 (8) of The Telecommunications Act ("The Act") which states,

Section 29(2):

> *"The Authority may establish price regulation regimes, which may include setting, reviewing and approving prices, in any case where –*
>
> *...(b) a concessionaire operating a public telecommunications network or providing a public telecommunications service cross-subsidises another telecommunications service provided by such concessionaire; or*
>
> *(c) the Authority detects anti-competitive pricing or acts of unfair competition."*

Section 29(8):

> "*For the purposes of this Part (price regulation) and wherever the issue of dominance otherwise arises in the Act, the Authority may determine that an operator or provider is dominant where, individually or jointly with others, it enjoys a position of economic strength affording it the power to behave to an appreciable extent independently of competitors, customers and ultimately consumers and for such determination, the Authority shall take into account the following factors:*
>
> *(a) the relevant market,*
>
> *(b) technology and market trends,*
>
> *(c) the market share of the provider*
>
> *(d) the power of the provider to set prices…".*
>
> *(e) the degree of market differentiation among services in the market;*
>
> *(f) any other matters that the Authority deems relevant.*

Given the sections of the above legislation, the Authority is empowered to review the boundaries of the domestic retail mobile market. This will provide further insight into the relevance of the markets, as a first principle to market regulation and for ensuring the development and the sustainability of fair competition in same.

1.5. Definition of Terms

Bolt-on/add-on	A form of supplementary mobile "top-up" service, offering some combination of mobile call minutes, messages, and/or data for a specific price.
Dongle	A small, portable modem that allows a single user to connect wirelessly to the Internet (for example, via a laptop).
Ex-ante	Occurring before. For example, ex-ante regulation refers to the setting of regulation to be followed, rather than imposing regulation after an event has occurred.
Ex-post	Occurring "after the fact". For example, ex-post regulation refers to imposing regulation after an event has occurred rather than setting regulation to be followed.
Mobile access	Mobile access relates to a retail service which allows users to receive calls and SMSs. In other words, mobile access is the service enabled by having a SIM without necessarily purchasing calls, messages or data (either via bundles/allowances or on a PAYG basis).
Off-net	A term used to describe when a service provider offers a voice, data or video service to a customer and the service provider needs to partially provision that service using another service provider's network.
On-net	A term used to describe communication with others on the same network.

2. Approach to Determining Dominance in the Relevant Markets

Section 29 (8) of the Act establishes that:

> "…*The Authority may determine that an operator or provider is dominant where, individually or jointly with others, it enjoys a position of economic strength affording it the power to behave to an appreciable extent independently of competitors, customers and ultimately consumers…"*

and further states that:

> "the Authority shall take into account the following factors: … the relevant market…".

In general, there are three dimensions to defining relevant markets:

i. Product scope, whereby the relevant product market consists of all services or products which enough end users regard as sufficiently interchangeable to render a significant increase in price unprofitable (described in more detail in section 2.1)

ii. Customer segmentation, whereby the customer market considers whether there is a need to define separate relevant markets for any sub-set of end users, such as business and residential end users

iii. Geographic scope, whereby the relevant geographic market is defined as the area over which competitive conditions are sufficiently similar to define that area as a relevant market[10]

[10] This analysis only considers service provision within Trinidad and Tobago. This is because the Authority does not have jurisdiction beyond the borders of Trinidad and Tobago and this assessment concerns domestic services offered to residents of the country for domestic use. In addition, concessionaires in Trinidad and Tobago typically only hold licences to provide services within the national geographic boundaries of Trinidad and Tobago. Although the assessment takes into account some communications service providers based/incorporated outside of Trinidad and Tobago (such as OTT providers like Skype), in the context of how these providers might influence the demand and supply of domestic mobile retail services in Trinidad and Tobago, it only considers the markets they serve within Trinidad and Tobago. This approach is in line with international precedent.

2.1. Relevant Product Scope

As an initial step, it is important to determine which products and services are considered possible substitutes by end users or suppliers, for example, as a result of their having similar product characteristics and/or prices[11]. Defining the relevant product market is important, as a service provider's ability to influence the price of a product will depend, amongst other things, on the availability and pricing of potential substitutes for this product, looking at both the demand and supply of potentially similar products.

The standard method for defining a product market is to perform a small but significant and non-transitory increase in price (SSNIP) test, also referred to as the hypothetical monopolist test. This test considers the likely impact of a hypothetical monopolist slightly increasing the price of a "focal product" (i.e., the product under consideration) from the competitive level. If a sufficient number of end users would be encouraged to switch to buying alternative products (i.e., there is sufficient demand-side substitution) and/or sufficient suppliers would be encouraged to switch to supplying the focal product (i.e., there is supply-side substitution), then such a price rise could not be profitably maintained.

In effect, it would be unprofitable for the monopolist to keep prices at this new higher level, since the lost margins from a fall in volumes sold by the hypothetical monopolist would more than offset the increase in margin on the volumes it continues to sell. If this is the case, then the other products to/from which the end users/suppliers would be expected to switch can be considered sufficiently close substitutes for the focal product and hence part of the same economic market. Consequently, this test helps to determine the product boundaries of the market.

Assessing the extent of possible demand-side and supply-side substitution is central to the market definition exercise. It is possible to determine quantitatively the necessary degree of substitution for a SSNIP to become unprofitable and hence the extent to which two or more

[11] This assumes that prices are set at a level which would be consistent with those in a competitive market.

products are in the same market. This can then be compared to estimated cross elasticities of demand and supply to determine if, in effect, a group of products are in the same market[12].

However, market definition exercises in the telecommunications sector, particularly those undertaken in a regulatory context, are often not conducted quantitatively. This reflects the difficulty of accurately estimating cross elasticities between goods. In addition, where there is ex-ante regulation of tariffs in place — particularly in a regime where the tariff rebalancing process is not completed[13] — it may be the case that the current prices do not reflect competitive levels. This can add further difficulty to quantifying the SSNIP test, where the price increase should be assumed to be from the competitive level.

Given these challenges, market definition exercises typically rely on more qualitative assessments of the degree of potential switching between products. Indeed, given the evidence available, the Authority believes it is appropriate to rely on a range of evidence to inform views on the likely responses of end users and suppliers to a SSNIP for domestic mobile services. This approach is in accordance with international best practice. However, where a comprehensive cost model exists, quantitative data may be preferred only for the determination of the impact on concessionaires' profitability to a change in the price and/ or terms of their services. Therefore, the use of both qualitative and quantitative data provides a useful check and balance for the determination of consumer preferences and their impact on firms' profitability in the event of a SSNIP.

[12] Cross elasticity of demand (supply) measures the extent to which demand (supply) of one good can be expected to change following a change in the price of another good. If the estimated cross elasticity of demand (supply) between two goods is greater than the estimated degree of substitution necessary to make a small but significant non-transitory price rise non-profitable, this may be taken as evidence that the good in question and the substitute good form part of the same economic market.

[13] This mostly relates to retail fixed telephony services where, traditionally, fixed line rental tariffs were, at times, offered below cost and then cross-subsidised by other retail fixed services (such as international outgoing calls).

2.1.1. Determining the focal product

When undertaking a market definition exercise for the purpose of designing ex-ante regulation, it is useful to start with a list of markets and then analyse the extent to which these market boundaries are appropriate. Subject to the result of the SSNIP test, the dimensions of each market will then be adjusted in an iterative process until an appropriate set of relevant economic markets has been identified. This analysis should consider both demand-side and supply-side considerations.

2.1.2. Demand-side substitution

Demand-side substitution looks at the extent to which prices for the focal telecommunications services or related products in a market (i.e., the service(s) in the market to which the SSNIP test is being applied) are constrained by the availability of other telecommunications services or related products. Demand-side substitution can typically provide a more immediate competitive constraint than supply-side substitution or the threat of potential competition.

In assessing potential demand-side substitution from retail domestic mobile services to other services, the Authority has analysed, amongst other things, the following factors:

(i) The functionality and non-price characteristics of the relevant retail services and products available in Trinidad and Tobago
(ii) Quality of service information on these services
(iii) Uptake and usage trends in Trinidad and Tobago
(iv) Available information on customer's switching behaviour for these services in Trinidad and Tobago [14]

[14] This is based on responses to the TATT- CMR Survey and also relies on market evidence. The Authority also asked concessionaires, in requests for qualitative information, about customers' switching patterns. A review of the impact of number portability in the domestic market when compared to that experienced in the UK market also indicates the potential influence of culture on customer switching patterns.

2.1.3. Supply-side substitution

Even in the absence of demand-side substitution, supply-side substitution may still provide a constraint on the ability of a service provider to increase its prices. An examination of supply-side substitution looks at the extent to which the price of a service is constrained by the ability of a service provider to start offering the relevant service in the short term, in response to the increase in price of the focal product above the competitive level. To be able to do so, that service provider must be able to switch or enter the market without incurring significant additional costs or risks.

In assessing possible supply-side substitution in relation to retail domestic mobile services, the Authority has analysed the following factors:

(i) Historic evidence of entry and expansion in the mobile service market in Trinidad and Tobago

(ii) The characteristics of retail domestic mobile services, in terms of any legal, regulatory or economic barriers for new concessionaires to enter the market (i.e., barriers to entry and/or expansion), including any regulatory measures or commercial models that may reduce any prevailing barriers to entry such as (regulated network access, MVNO hosting, etc.)

2.2. Customer Segmentation

The relevant customer dimension of any product market will again be assessed in terms of demand-side and supply-side substitutability. On the demand side, there is a need to assess whether there are differences in demand from different customer segments, which would constrain end users' ability to substitute between services aimed at different groups of end users. On the supply side, there is a need to assess whether suppliers of services to one customer segment are easily able to switch to providing services to other customer segments.

In the context of retail domestic mobile services, the relevant considerations are:

(i) whether service offerings for residential and non-residential end users form part of the same relevant product market.
(ii) whether prepaid and post-paid service offerings form part of the same relevant product market (taking into consideration that different groups of end users might opt for different service offerings).

The Authority's assessment, therefore, takes account of the following information:

(i) The demand characteristics of each customer segment
(ii) The commonality of customer sales channels used by providers to serve different groups of end users (and therefore the ability of a provider to switch capacity from serving one group of end users to another)
(iii) The range and characteristics of mobile services provided by Operator X and Operator Y to different customer segments
(iv) The prices charged by Operator X and Operator Y for retail domestic mobile services provided to different customer segments
(v) The contractual terms offered to different customer segments and any other likely barriers to switching between the offerings for these customer segments.

2.3. Relevant Geographic Scope

In addition to defining product markets, it is also important to define the geographic boundaries of each market. Typically, in the telecommunications sector, these markets are defined nationally (in line with the geographic scope of the service licences/concessions).

The need for geographic submarkets then depends on whether there are significant differences in competitive dynamics between different parts of the country, and whether such boundaries are stable[15]. In line with approaches undertaken as part of market definition exercises in other jurisdictions[16], when determining the geographic scope of each market, the Authority's default assumption is, in the absence of evidence to the contrary, that markets are national. This is due to the operating licences/concessions also being granted on a national level. Furthermore, even when there are differences in the competitive dynamics (i.e., due to differences in network coverage between concessionaires), national pricing tends to constrain concessionaires in areas where competition may appear, at first, less intense.

In the assessment of the relevant geographic market for retail domestic mobile services, the Authority has considered the following information:

(i) Network coverage data for each licensed concessionaire, describing the areas and proportion of the population covered by their network

(ii) The range of retail mobile services provided by Operator X and Operator Y within specific geographical regions and the extent to which these may differ across the country

(iii) The prices charged by Operator X and Operator Y for retail domestic mobile services and the extent to which these may differ across the country.

[15] This would avoid situations where changes in geographic boundaries could lead to geographic market definitions being outdated over time and the wrong regulatory remedies being applied.

[16] See, for example, page 20 of the 2018 EC *Staff Working Paper - Guidelines on market analysis and the assessment of significant market power* (SMP) under the EU regulatory framework for electronic communications networks and services.

2.4. Stages to Determine the Relevant Product Market(s) for Domestic Retail Mobile Services

It is first necessary to assess how the retail domestic mobile services considered in this analysis differ from the market definition set out in the concession (i.e., mobile voice origination services). In doing so, the Authority is guided by the following key observations:

(i) In the context of defining a retail market, voice origination is a wholesale market. These origination services are necessary to support the provision of end-to-end retail mobile services. At the retail level, end-to-end call services are considered (i.e., both the origination and termination legs), in line with how these services are offered to end users.

(ii) Retail domestic mobile services commonly include a wider range of services, beyond voice. In particular, most mobile concessionaires offer end users voice, messaging (SMS/MMS) and data services. This is also the case in Trinidad and Tobago, as further discussed in section 3. As such, the Authority has considered the entire range of retail domestic mobile services currently offered by concessionaires when defining the relevant boundaries for retail domestic mobile service market(s), particularly as they are often sold in bundles and provided over common infrastructure.

2.5. Conclusion

Given the above, there are several considerations to be made when defining the relevant market relating to retail domestic mobile services. These are as follows:

(i) Whether different types of domestic mobile services (i.e., mobile access[17]-only products[18], domestic calls, messaging and mobile data-only services) are in the same product market

(ii) Whether mobile services offered to different customer segments are in the same product market (i.e., prepaid and post-paid service offerings and residential and business service offerings)

(iii) Whether other (non-mobile) telecommunications services are a substitute for retail domestic mobile services, namely:

   (a) fixed services (considering both voice calls and Internet access)
   (b) over-the-top (OTT) services (considering both voice and messaging)

In sections 3 to 5 of this Determination, the Authority considers each of the above in turn, examining the likely extent of demand-side and supply-side substitution for each in the event of a SSNIP of the focal product.

[17] Mobile access relates to a retail service. Specifically, it refers to the service which allows users to *receive* calls and SMSs. In other words, mobile access is the service enabled by having a SIM but without purchasing calls, messages or data (either via bundles or allowances or on a Pay As You Go basis).

[18] In some instances, mobile access-only products are referred to as "access-only" to ensure the Determination is reader friendly. For example, "end users who subscribe to mobile access-only products" may be described as "access-only end users". Use of the term "mobile access" alone refers to mobile access more generally, for example, in reference to mobile access as a component of a bundled service and does not necessarily refer to the standalone mobile access-only product, unless otherwise specified.

3. Assessment of the Need for Separate Markets for Different Domestic Mobile Services

Retail domestic mobile services include mobile access, mobile domestic calls (off-net and on-net)[19], mobile messaging (MMS/SMS) and mobile data services. These services can be offered to different groups of end users and using different payment mechanisms (i.e., prepaid and post-paid methods). Therefore, it is necessary to determine whether there is a need to define separate product markets for any of these services, or subsets thereof, or indeed, whether domestic mobile services actually form part of a wider economic market.

This analysis is conducted by starting with the retail mobile access-only product as the focal product, and then applying the SSNIP test concept to determine whether this forms a product market on its own or should be widened to include any of the other services. The Authority first considers whether retail mobile access and domestic call and messaging services are in the same product market (see sub-section 3.1). The Authority then considers whether retail mobile data-only services should also form part of that product market (see sub-section 3.2). This is followed by an assessment of whether there are separate product markets for prepaid and post-paid offerings (see sub-section 3.3) and services provided to residential and business users (see sub-section 3.4).

The question of whether the market should be widened further to include non-mobile services is considered separately, in section 4.

[19] In this document, the terms "domestic mobile calls", "mobile calls" and "calls" are used interchangeably, according to the context.

3.1. Are Mobile Access and Domestic Call and Messaging Services in the Same Product Market?

The purpose of this sub-section is to assess whether mobile access services should be considered part of the same product market as mobile call and messaging services.

3.1.1. Demand-side considerations

In Trinidad and Tobago end users must purchase an access service (i.e., SIM card) and handset in order to make and receive domestic calls and domestic SMS/MMSs. It is pertinent to note that most mobile service plans contain monthly allowances of both domestic mobile call and messaging services. Therefore, when end users choose among the different offers available, they are likely to consider the overall price (i.e., any fixed cost of the access, plus the total cost of expected domestic calls and SMS/MMS usage)[20] and characteristics (e.g., coverage, quality of service, flexibility, etc.) of both access and domestic call/messaging services together. Thus, when comparing the functionalities and characteristics of retail mobile access, call and messaging services, these services are more likely to be complements than substitutes.

The combination of mobile access and calls/SMSs is provided through prepaid and post-paid offers sold by both concessionaires. Operator X and Operator Y both offer post-paid tariff plans. These are taken by 21% of all mobile end users[21], and all contain bundles that include mobile access, call/SMS and data services. Neither concessionaire advertises any offer on its website allowing end users to purchase a post-paid mobile plan without any monthly allowance for calls, messages or data usage. This is in line with the general demand for two-way communication (i.e., where an end user wishes to both make and receive calls and messages). This means that even an end user wishing to only receive calls/messages would have to purchase a bundled offer.

For prepaid offers, which are taken by 79% of all mobile end users, Operator Y does not advertise any offer on its website allowing customers to purchase a SIM card separately from

[20] Prices (in this section and throughout the document) are expressed inclusive of VAT and rounded to the nearest TTD for clarity of presentation. This does not impact the general findings of the analysis.

[21] Based on concessionaire data submitted to the Authority, the latest date available was June 2018.

other mobile services (i.e., all prepaid SIM cards include some credit for calls, messages or data usage).

Operator X, on the other hand, allows end users to buy prepaid mobile access on a standalone basis (a mobile access-only product), by purchasing a SIM card without any pre-loaded credit for TT$50[22]. Under this option, end users who wish to make calls or send messages have to purchase credit and are charged prepaid rates (prepaid PAYG contract) for usage.

However, despite having this option, the available evidence, outlined in Figure 1 below, suggests that it is unlikely that end users in Trinidad and Tobago would decide to purchase mobile access-only products alone. The majority of end users (62% of respondents to the TATT- CMR Survey) state that they mostly use their mobile phone to make phone calls rather than only receive them. (Figure 1 shows the sum of respondents whose main use of their mobile device is to make, as opposed to receive, calls). Given this, a consumer would have no incentive to purchase a SIM card without any credit on it unless they could purchase the credit separately for less or from another concessionaire. Indeed, it is currently not possible to buy a SIM card from one concessionaire and add credit from another concessionaire. In addition, it is more expensive to buy a mobile access-only product and then rely on PAYG rates for calls and SMS, compared to buying access in combination with a package (prepaid or post-paid) plans [23].

[22] https://support-tt[redacted]c/en-us/articles/115013188727-Sim-Card-Management

[23] PAYG users may have a greater incentive to engage in Wi-Fi offloading (using Wi-Fi networks where available, rather than mobile data) compared, for example, to other groups of end users who subscribe to plans which provide large or possibly unlimited data allowances, thereby, potentially narrowing the effective differences in prices for a given level of usage. This effect may become stronger as the extent of Wi-Fi availability in Trinidad and Tobago increases.

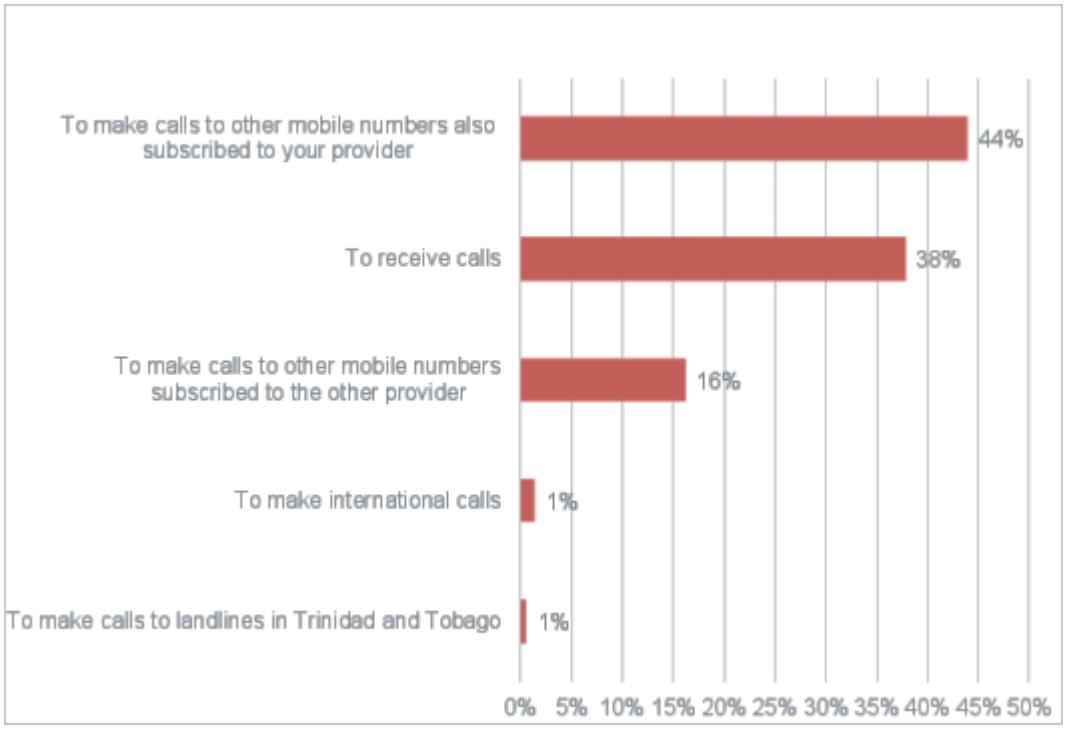

Figure 1: "For which of the following do you use your mobile phone mostly?"

Source: TATT- CMR Survey

Whilst Figure 1 highlights that 38% of the TATT- CMR Survey respondents stated that they mostly use their mobile phone to receive phone calls[24], their stated average monthly usage is not dissimilar to that observed across the entire survey sample, suggesting that, whilst receiving calls may be the main use to which they put their mobile phone, it is not the only use[25]. Indeed, the TATT-CMR Survey provides further information to suggest that very few consumers use their mobile phone only to receive calls or messages. In particular, less than 12% of all respondents made under 20 minutes of outgoing calls per week, approximately 77% of this sub-group currently make at least some calls[26], and 84% of the remainder currently send some

[24] This does not imply that these respondents do not also value making calls from their mobile phone.

[25] For example, 76% of that sub-sample stated that they use their phone for at least 20 minutes per month, with 42% reporting an average monthly usage of 60 minutes or more. This compares to 87% of the total sample stating a monthly usage of more than 20 minutes and 54% stating more than 60 minutes.

[26] As evidenced by a total of approximately 77% of relevant respondents stating that they would reduce the volume of calls they made in the event of an increase in prices, implying that these users currently make some outgoing calls. Those who stated other responses do not necessarily make no calls; there is simply no irrefutable proof that can be elicited from the responses to the TATT-CMR Survey.

messages[27]. This means that, at most, just 0.7% of respondents reported no outbound usage on their phones.

The Authority considered data from concessionaires on mobile end users' consumption patterns. However, the Authority considers it reasonable to assume that access-only end users are likely to form part of the wider group of customers that primarily use PAYG tariffs (as they mostly value the access component and not any call allowances within mobile bundles). Average monthly domestic call volumes of PAYG end users was approximately 70 minutes per connection in mid-2018[28]. This suggests that these end users not only value receiving calls but also use their mobile phone to make calls, increasing the likelihood of them considering mobile access-only and bundled services as substitutes in case of a SSNIP by a hypothetical monopolist.

The Authority, therefore, concludes that, on balance, mobile access, call and messaging services are likely to be part of a single product market, due to the demand-side considerations set out above.

3.1.2. Supply-side considerations

The Authority also considers that mobile access and domestic call and messaging services are supply-side substitutes. Globally, mobile concessionaires generally deploy mobile network infrastructure to enable them to provide both mobile access and domestic call and messaging services (and other mobile services). This is also the case in Trinidad and Tobago, with both Operator X and Operator Y offering mobile access, domestic mobile calls and messaging services via their mobile networks.

[27] As evidenced by a total of approximately 84% of relevant respondents stating that they would take some action (reducing usage or switching provider) in the event of a price increase, implying that these users currently send some messages. Similarly, to the case above relating to calls, those who stated other responses (for example, that they would take no switching action) in response to a price increase, do not necessarily send no messages at present; there is simply no clear evidence to demonstrate this.

[28] Based on data provided by Operator X and Operator Y

To determine whether mobile access-only products and other mobile services are supply-side substitutes, it is necessary to consider whether a concessionaire offering only mobile access services could feasibly begin to offer domestic call and messaging services in the event of a SSNIP by a hypothetical monopolist in domestic call and messaging services. Since mobile networks are generally designed and deployed to provide access, call and messaging services, any concessionaire hypothetically offering only access (or offering all services except access) would also be able to easily offer the full suite of retail mobile services or without network expansion (including domestic call and messaging services), in the event of a SSNIP by a hypothetical monopolist.

3.1.3. Conclusions

The assessment above suggests that retail mobile access and domestic mobile calls/messaging should be considered in the same product market. End users purchase these services considering the characteristics of both access and call/messaging services. This is because most end users buy these services jointly as part of mobile bundled offers (as opposed to mobile access only). Furthermore, as explained in sub-section 3.1.1, the TATT-CMR Survey provides evidence that no more than 62% of respondents make outgoing calls or messages[29] (i.e., do not use their mobile to only receive calls).

This is also reflected in the way these services are offered in Trinidad and Tobago, where both concessionaires predominantly offer mobile access, call and messaging services as product bundles. On the supply side, concessionaires use the same infrastructure and sales channels to provide access and call/messaging services and are required to provide both in order to be able to compete for end users. The above conclusion on defining a single product market for mobile

[29] This indicates a minority group of roughly 38% may hold phones largely for accessibility and thus may be insensitive to price changes for outgoing calls. This group may include GPS, security services, mobile phones where the service is accessed using Wi-Fi).

access, call and messaging services is also in line with international precedent from, for example, Bermuda, Europe and the GCC region.[30,31,32]

3.2. Are Mobile Data Services in the Same Product Market as Mobile Access, Call and Messaging Services?

The purpose of this sub-section is to assess whether mobile data services should be considered part of the same product market as mobile access, call and messaging services, as defined in sub-section 3.1.

Mobile data services can be split into two main products:

(1) Mobile data usage over smartphones, with data access being sold as part of a bundled offer containing calls, messaging and data services

(2) Dedicated mobile broadband services which allow users to access the Internet using a SIM card or dongle via their laptops, tablets and smartphones

30 The Regulatory Authority of Bermuda found access and call services to be in the same market. See:

https://rab.bm/documents/preconsultation-market-review-a-pdf-2/?wpdmdl=11768&refresh=5c8bae277b51c1552657959

31 As part of its recent merger investigations into mobile network concessionaires, the EC has defined mobile voice and data services to be part of a single market for retail mobile telecommunications services. This has predominantly been based on supply-side substitutability and end users' common usage of mobile devices to make calls and access the Internet. See, for example:

http://ec.europa.eu/competition/mergers/cases/decisions/m6992_20140528_20600_4004267_EN.pdf

32 As part of their market reviews, regulatory authorities in Bahrain, Oman, Qatar, Saudi Arabia and the UAE have all defined as single product market for retail mobile services, covering mobile access, call, messaging and data services.

Of these, category (1) currently dominates services in Trinidad and Tobago, with mobile data services sold as part of a bundle accounting for 99%[33] of data usage in the country. In contrast, mobile data-only plans in Trinidad and Tobago are still very limited and offered by only one of the two concessionaires, with limited uptake to date.

Although the nature of the data service provided under both products is identical, there are some differences in the features of the demand for these services. The Authority, therefore, assesses the extent of demand-side substitution between mobile data services and mobile access, call and messaging services, separately for each mobile data product group, as set out in sub-section 3.2.1[34]. On the other hand, data service can be supplied along with other mobile services, so the Authority, therefore, considers jointly these products in the assessment of supply-side substitution. (This is discussed in sub-section 3.2.2.).

3.2.1. Demand-side considerations

In assessing potential demand-side substitution, the Authority first examines the characteristics of mobile data products.

3.2.1.1. Product characteristics

End users in Trinidad and Tobago have two ways of accessing mobile data services described below.

(1) Smartphone offers: These are sold in PAYG plans (without any monthly allowances), prepaid plans with monthly allowances and post-paid plans with monthly allowances. Under the PAYG options, end users are charged per MB of data used, with these offers only being available to prepaid users who are not subscribed to a plan, or to prepaid and post-paid mobile end users who exceed their plan's data allowance[35]. Bundles, on the other hand, contain a

[33] These proportions are estimates based on the evidence available from the concessionaires' data submitted to the Authority.

[34] The Authority notes that, given the limited uptake and mobile data-only service offerings available to date, it is difficult to fully assess whether these are in the same product market as other mobile services. As such, the remainder of sub-section 3.2.1. focusses mostly on mobile data services offered as part of mobile bundles.

[35] In the case of prepaid plans, end users need to have sufficient credit on their phone to consume anything beyond the plan allowance.

combination of mobile data, calls and SMS allowances (after which a PAYG charge would apply).

(2) Data-only/mobile broadband offers (dongles): These are data-only packages which allow end users to access the Internet via a dongle, Mifi modem, etc. No call or messaging allowances are included in these plans. In Trinidad and Tobago both operators offer Unlimited Dongle/Mi-Fi Plans[3637], offering unlimited 4G/LTE data within the price range of TT$249 to TT$350 per month. The device cost is advertised as "FREE" by at least one of the providers of this service.[38]

Tables 1 and 2 show the prepaid and post-paid mobile (smartphone/bundled) plans that include a data allowance and present all the prepaid and post-paid residential mobile bundles currently offered in Trinidad and Tobago.

36 https://[redacted]tt/mifi-faq/

37 https:/[redacted]/tt/en/mobile/help/dongle-mi-fi-t-cs.html

38 A replacement charge of TT$699 (VAT exclusive), is stated for the MIFI device where arising.

Table 1: Residential prepaid mobile bundled plans (TT$)

Concessionaire	Product	Validity period	Price (TT$)	Data included	Minutes included	SMS/MMS included
Operator X	Quick Pick - Option 1	30 days	349	Unlimited	Unlimited local minutes	On-net unlimited
	Quick Pick - Option 2	7 days	99	Unlimited	Unlimited local minutes	On-net unlimited
	Quick Pick - Option 3	1 day	20	Unlimited	Unlimited local minutes	On-net unlimited
	Quick Pick - Option 4	1 hour	5	Unlimited WhatsApp Facebook	Operator X to Operator X unlimited	On-net unlimited
	2G/4G Quick Pick - Option 1	30 days	250	3 GB	300 anywhere minutes	On-net unlimited
	2G/4G Quick Pick - Option 2	30 days	200	1 GB	100 anywhere minutes	On-net unlimited
	2G/4G Quick Pick - Option 3	10 days	100	1 GB	100 anywhere minutes	On-net unlimited
	2G/4G Quick Pick - Option 4	5 days	60	500 MB	50 anywhere minutes	On-net unlimited
	2G/4G Quick Pick - Option 5	3 days	50	300 MB	30 anywhere minutes	On-net unlimited
Operator Y	Prepaid Plan 4	30 days	393	Unlimited	Unlimited local minutes	All unlimited
	Prepaid Plan 3	30 days	242	3 GB	Unlimited local minutes	All unlimited
	Prepaid Plan 2	7 days	111	Unlimited	Unlimited local minutes	All unlimited
	Prepaid Plan 1	1 day	23	Unlimited	Unlimited local minutes	All unlimited

Source: The following concessionaire websites, accessed February 13, 2019
Operator X: *https://[redacted]tt/en/mobile/plans-services/prepaid.html*
Operator Y: *https://[redacted]tt/mobile-4-2-2/#preunlimited*

Table 2: Residential post-paid mobile bundled plans (TT$)

Concessionaire	Product	Requirements	Monthly subscription price (TT$)	Data allowance	Call allowance	SMS/ MMS allowance
Operator X	Post-paid Unlimited 350	Security deposit	350	Unlimited data	Unlimited local + 300 anywhere minutes	Unlimited worldwide
	Post-paid Unlimited 550	Security deposit	550	Unlimited data	Unlimited anywhere minutes	Unlimited worldwide
	Post-paid Unlimited 750	Security deposit	750	Unlimited data[39]	Unlimited anywhere minutes	Unlimited worldwide
Operator Y	Lite	None	111	250 MB	205 minutes	Unlimited worldwide
	Everything 199	None	224	3 GB	300 local minutes + 20 international minutes	Unlimited worldwide
	Everything 299	None	336	4 GB	500 local minutes + 50 international minutes	Unlimited worldwide
	Post-paid Unlimited	None	393	Unlimited	Unlimited local minutes	Unlimited worldwide
	Everything 399		449	Unlimited	Unlimited local + 100 international minutes	Unlimited worldwide
	Everything 525		591	Unlimited	Unlimited local minutes + 200 international minutes	Unlimited worldwide
	Premium		674	Unlimited	Unlimited local minutes + 150 international minutes	Unlimited worldwide

Source: The following concessionaire websites, accessed February 13, 2019
Operator X: *https://[redacted]tt/en/mobile/plans-services/post-paid.html*
Operator Y: *https://[redacted]tt/mobile-4-2-2/#posteverything*

[39] This plan includes an additional roaming allowance compared to the post-paid Unlimited 550 package (2 GB of data allowance to be used in the USA).

Tables 1 and 2 also show that end users can purchase prepaid and post-paid mobile bundles of calls and SMSs with unlimited data for the same price as Operator X's Post-paid Unlimited Dongle/Mi-Fi Plan. This suggests end users may be indifferent to the differences between the two offers and base their subscription decision on non-price factors, for example, any devices which might be included in the offer.

End users requiring only an Internet connection might not see bundles as attractive. However, in case of a SSNIP in mobile data-only products, they have the option to switch to a bundle and use the Internet connection via their smartphone, potentially using that to tether to other devices. A mobile data-only user could also, if faced with a SSNIP in that product, switch to a PAYG plan (as this also allows the customer to use mobile data only). However, existing price differentials between these plans are unlikely to support such substitution. (This is discussed further in sub-section 3.2.1.3.)

Therefore, in terms of product features, the Authority provisionally concludes that data services appear to be used jointly with calls and SMS (for those end users valuing all three services), while mobile access (offered as part of a mobile bundle or a mobile data-only connection) is necessary to access data services. These product characteristics suggest that the three may be part of the same market due to end users' need and preference to purchase the services together.

3.2.1.2. Uptake and usage trends

The TATT- CMR Survey shows that 54% of total respondents are currently using mobile data services (i.e., as part of a smartphone plan), with only 13% using mobile broadband services. Additionally, around half of the mobile broadband users in the survey sample stated that they have more than one way of accessing the Internet, with 81% of those respondents also using mobile data services on their mobile phones. This suggests that end users in Trinidad and Tobago prefer accessing mobile data services in combination with mobile calls and SMSs (i.e., via smartphone plans) rather than data as a standalone product.

Furthermore, the vast majority (97%) of all survey respondents have a smartphone or tablet. Given the high mobile penetration rate in Trinidad and Tobago[40] and national coverage of mobile data services, this suggests that mobile data services are readily available to all mobile service end users. The only way for end users to access smartphone-based, mobile data-only services on a standalone basis is through PAYG. However, the PAYG option is priced significantly above the level of mobile bundled products (as explained in sub-section 3.2.1.3[41]).

3.2.1.3. Relative prices

Within the context of smartphone mobile bundled offers, which appear to be the main product offering end-users access to mobile data services, end users can choose between the following:

(i) PAYG options which charge end users based on actual usage
(ii) Mobile bundles which provide end users with predetermined allowances of calls, SMSs and data

Prices of PAYG offers differ significantly from those in mobile bundles. Table 3 illustrates that per-MB PAYG prices range between TT$1.90/MB and TT$2.25/MB, while the effective price via bundles (on average) [42] ranges between maximum price points of TT$0.17 and TT$0.40 for both concessionaires currently operating in the domestic retail mobile market of Trinidad and Tobago.

[40] 93% of all survey respondents stated they currently use mobile access, calls and SMS services.

[41] As noted in sub-section 3.1.1, PAYG users may have a greater incentive to engage in Wi-Fi offloading compared to end users with large or unlimited data allowances, which could have the effect of narrowing the effective difference in prices for a given level of usage. However, as detailed in that sub-section, the Authority notes that many end users with large or unlimited data allowances are also likely to use Wi-Fi where possible, and the importance of mobility, particularly to access mobile services while away from areas with a Wi-Fi presence, is likely to limit this effect.

[42] This value is obtained considering the bundle with the lowest data allowance, supposing that the whole price of the bundle only refers to the amount of data available. This seems reasonable given the average data usage per connection remaining below 3.5 GB per month in 2018.

Table 3: PAYG mobile data prices (TT$)

	Operator X	Operator Y
Prepaid	1.90/MB	2.25/MB
Post-paid	2.25/MB	Not available on Operator Y's website

Source: The following concessionaire websites, accessed February 13, 2019:
Operator X: *https://[redacted]tt/en/mobile.html*
Operator Y: *https://[redacted]tt/mobile-4-2-2/*

Based purely on relative unit prices, observed in Table 3 above, it is improbable that end users would opt for PAYG data options to meet their mobile data needs[43]. This is further the case because, in respect of post-paid tariffs, PAYG options only apply when an end user exceeds the monthly data allowance, and are, therefore, likely to be used as an add-on to mobile bundles (plans) rather than a demand-side substitute.

Based on the retail prices for standalone mobile services, as captured in Tables 1 and 2, these services tariffs are in line with mobile bundle prices. Consequently, demand may be considered substitutable between both product types. The Authority has observed that standalone mobile services may account for a very small proportion of total mobile end users[44]. For example, only 13% of all respondents to the TATT- CMR Survey stated that they use these services. However, the Authority considers that standalone mobile data services may increase significantly in the future[45]. As discussed in the context of Tables 1 and 2, the retail prices for these services are in line with mobile bundle prices, this supports potential demand substitutability between both product types.

[43] Whilst mobile end users may aim to reduce their mobile data costs by utilising Wi-Fi networks where available (i.e., Wi-Fi offloading), this option is available to all mobile end users (independent of their contract type). As such, it is unlikely to impact the demand-side substitutability of these services.

[44] At the time of writing, only one operator offered standalone mobile data products.

[45] The Authority reserves it right to conduct periodic and timely reviews of the market and all submarkets, as it deems necessary, for accurate regulatory decision making, in accordance with the Authority's regulatory functions and mandate.

3.2.1.4. Conclusions on demand-side substitution

Considering the analysis of product characteristics, relative pricing and uptake and usage trends, the Authority provisionally concludes that, from a demand-side perspective, mobile data services offered as part of a smartphone bundle should be considered a complement to the other services within these bundles (i.e., mobile access, regular calls and messaging).

Given the limited uptake of mobile data-only service offerings, it is difficult to fully assess whether they are demand-side substitutes to other mobile services. However, based on the limited information available, the Authority concludes that this is the case, mostly due to these services being offered at similar prices to the mobile data service included within mobile bundles.

3.2.2. Supply-side considerations

From a supply-side perspective, mobile data services are provided through the same infrastructure used for access, call and messaging services, as well as through the same sales channels. This holds for both types of mobile data services (i.e., data as part of mobile bundles and mobile data-only services). In line with the arguments set out in the previous section on mobile access, call and messaging services, this makes them supply-side substitutes.

3.2.3. Conclusions

Taking demand and supply considerations together, the Authority provisionally concludes that mobile data services belong to the same market as mobile access, domestic call and messaging services; they are substitutes from the supply side and, on the demand side, offer similar functionality to end users. The above conclusion on defining a single market for mobile access,

call, messaging and mobile data services is, again, in line with international precedent from, for example, Bermuda[46], Europe[47] and the GCC region[48].

[46] https://rab.bm/documents/market-review consultation/?wpdmdl=13600&refresh=5c9de7dc1a3d31553852380

[47] In recent ex-post competition merger control investigations across Europe, authorities have considered mobile voice and broadband services to be within a single product market:

- Ireland H3G-O2 merger (2014). The European Commission (EC) defined a single market for retail mobile telecommunications services due to supply-side substitutability.
- Germany O2-E-plus merger (2014). The EC again defined a single market for retail mobile telecommunications services due to supply-side substitutability.
- UK BT–EE merger (2015). A single market for mobile (voice, messaging and Internet access) services was considered, predominantly due to supply-side substitutability. This was supplemented with target analysis of specific segments (i.e., fixed-mobile bundles, business end users and packages, including high speeds and generous data allowances).

[48] As mentioned before, as part of their market reviews, regulatory authorities in Oman Qatar, Saudi Arabia, and the UAE have all defined as a single product market for domestic retail mobile services, including mobile data services.

3.3. Are Prepaid and Post-paid Mobile Services in the Same Product Market?

This section considers whether prepaid and post-paid domestic mobile services can be considered in the same product market.

3.3.1. Demand-side considerations

In line with the approach taken in sub-section 3.2.1.1., the Authority first examines the characteristics of the products in question.

3.3.1.1. Product characteristics

Both post-paid and prepaid mobile services allow end users to make and receive mobile calls, send SMS/MMSs, and access the Internet. However, there are some differences in the ways these services are provided to end users, which should be considered in an assessment of whether the two products are effective demand-side substitutes. In particular, the two main differences are as follows:

(1) Billing Arrangements

(i) End users on prepaid plans can purchase and pay upfront for credit for their prepaid account, which they can then use to buy mobile access and/or pay per-unit rates for usage, based on a standard tariff (prepaid rates for Operator X and prepaid PAYG rates for Operator Y[49]). They can also purchase one-off bundles of calls, messages and data[50].

(i) Post-paid end users are billed a fee at the end of each month, comprising the fixed subscription price for their chosen plan (which commonly covers both the access service plus a monthly call, messaging and data allowance) and charges based on "out of bundle" rates for any usage in excess of the monthly allowance.

[49] Operator X: https://[redacted]tt/en/mobile/plans-services/prepaid/prepaidrate.html
Operator Y: https://[redacted]tt/mobile-4-2-2/#preunlimited

[50] All the bundles provided in Trinidad and Tobago include a combination of all the three services.

(2) Requirements

While prepaid services are available to anyone (subject to a proof of identification), there are some criteria that prospective end users must meet in order to access post-paid services. These are:

(i) Deposits: Operator X's post-paid end users have to submit a deposit depending on their credit score[51].

(ii) Credit limits and credit checks: Operator X and Operator Y's post-paid end users are asked to set a credit limit for their subscriptions. This is accomplished by the customer's selection of his/her preferred plan[52], which, then needs to be approved by the concessionaire. In addition, end users can be subject to credit checks to access the service[53].

(iii) Contract length: The minimum contract length for post-paid subscriptions, for both concessionaires' offers, is 18 months, whereas prepaid vouchers have a validity period of 1, 7 or 30 day(s), after which a user can switch to a different voucher if they wish (either from the same provider or by purchasing a SIM from another provider).

(iv) Usage allowances: Prepaid and post-paid offerings are increasingly becoming alike, with both services now being offered as mobile bundles (comprising varying allowances of data, domestic calls and SMSs). Prepaid services can, however, also be accessed on a PAYG basis (meaning that end users are provided calls, SMSs and data on a standalone basis) without the need for a plan subscription.

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[51] This applies to both prepaid and postpaid Operator Y users who do not satisfy the creditworthiness checks. See https://[redacted]post-paid-and-prepaid-terms-and-conditions/

[52] It is noteworthy that the customer choice of the preferred plan is based on costs, capabilities and terms and conditions of the packages available.

[53] In some cases, this can be waived in lieu of a security deposit.

Operator X:https:[redacted]/tt/en/mobile/help/plans-services/Post-paid_Plan_FAQs.html

Operator Y: https:/[redacted]tt/post-paid-and-prepaid-terms-and-conditions/

Despite the differences described above, there appear to be some relevant similarities in prepaid and post-paid plans, which suggest they are demand substitutes. First, the credit limits for post-paid services give financial control to these end users, which mimics the financial control of a prepaid plan subscription. In addition, in both cases, end users can arrange for their credit limits to be set above the monthly price of their plan so that they can "top up" their allowances by purchasing additional packages of services. These top-up packages might comprise only calls, only data[54] or a bundle of minutes, SMSs and data.

The top-up options offered by Operator X are called "bolt-on's" for post-paid and "add-ons" for prepaid services. They have similar characteristics in terms of quantity of additional allowances. They differ only in the payment method: upfront for prepaid end users and in arrears on a monthly basis for post-paid end users. Similarly, although Operator Y does not offer specific add-ons to prepaid end users, it does allow them to purchase bundles with a very short contract length (as short as 24 hours), which can be used as top-ups. Operator Y's post-paid end users, on the other hand, are offered different "add-on" options, with these being equivalent to Operator X's post-paid "bolt-on's".

There are some differences in the product features of prepaid and post-paid services. However, these seem to be outweighed by the numerous similarities and common aspects. Therefore, based on the product characteristics alone, prepaid and post-paid services appear to be increasingly comparable and potential demand substitutes. Lastly, emphasis is now directed towards examining for possible evidence of actual substitution between these two payment methods.

[54] An SMS-only option is not currently available for any of the concessionaires.

3.3.1.2. Uptake and usage trends

The majority of end users in Trinidad and Tobago subscribe to prepaid mobile plans. As of June 2018, prepaid plans made up around 79% of total mobile connections, down from 83% in January 2016[55]. During this period, the total number of prepaid mobile connections declined from 1.47 million to 1.21 million. This compared to an increase in total mobile post-paid connections from 0.30 million to 0.32 million. This contrasting pattern in uptake of prepaid versus post-paid offers could be indicative of some degree of substitution during this period. Furthermore, a comparison of the size of the decline in prepaid subscribers against the growth in post-paid subscribers shows that switching from prepaid to post-paid was certainly not the primary reason for the decline in prepaid subscribers (since the decline in prepaid is significantly greater than the increase in post-paid).

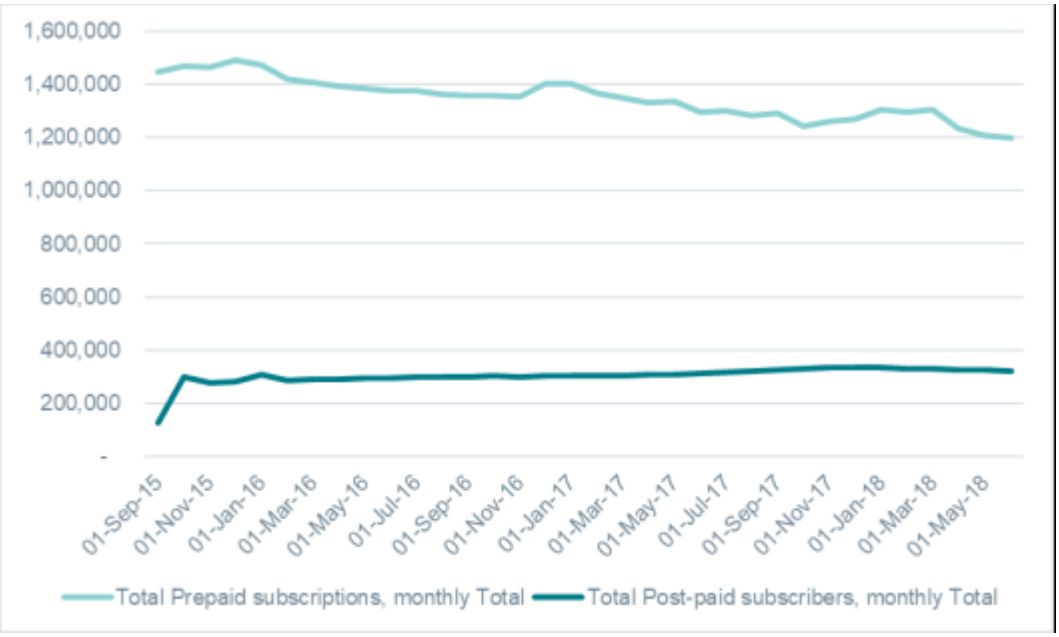

Figure 2: Prepaid versus post-paid connections, total mobile market

Source: Concessionaire data submitted to the Authority (December 2018 – January 2019)

[55] Concessionaire data submitted to the Authority.

3.3.1.3. Relative prices

Prices of prepaid and post-paid domestic mobile services, summarised in Tables 4 and 5, are similar, meaning that users are generally charged comparable amounts for a given level of usage. Prepaid plans offer lower monthly allowances than post-paid plans, more flexibility in terms of minimum usage and with a reduced contract length (as opposed to the minimum term of 18 months in all post-paid contracts), targeted at more price-sensitive end users with a lower usage profile. In contrast, post-paid plans often require higher minimum monthly payments for a higher monthly allowance, targeting those less budget-sensitive end users with a higher usage profile. However, despite these differences, and as shown in Tables 4 and 5, prices across both service types are broadly similar.

Table 4: Residential prepaid plans (TT$)

Concessionaire	Product	Validity period	Price (TT$)	Data included	Mins included	SMS/MMS included
Operator X	Quick Pick - Option 1	30 days	349	Unlimited	Unlimited local minutes	On-net unlimited
	Quick Pick - Option 2	7 days	99	Unlimited	Unlimited local minutes	On-net unlimited
	Quick Pick - Option 3	1 day	20	Unlimited	Unlimited local minutes	On-net unlimited
	Quick Pick - Option 4	1 hour	5	Unlimited WhatsApp Facebook	Operator X to Operator X unlimited	On-net unlimited
	2G/4G Quick Pick - Option 1	30 days	250	3 GB	300 anywhere minutes	On-net unlimited
	2G/4G Quick Pick - Option 2	30 days	200	1 GB	100 anywhere minutes	On-net unlimited
	2G/4G Quick Pick - Option 3	10 days	100	1 GB	100 anywhere minutes	On-net unlimited
	2G/4G Quick Pick - Option 4	5 days	60	500 MB	50 anywhere minutes	On-net unlimited
	2G/4G Quick Pick - Option 5	3 days	50	300 MB	30 anywhere minutes	On-net unlimited
Operator Y	Prepaid Plan 4	30 days	393	Unlimited	Unlimited local minutes	All unlimited
	Prepaid Plan 3	30 days	242	3GB	Unlimited local minutes	All unlimited
	Prepaid Plan 2	7 days	111	Unlimited	Unlimited local minutes	All unlimited
	Prepaid Plan 1	1 day	23	Unlimited	Unlimited local minutes	All unlimited

Source: The following concessionaire websites, accessed February 13, 2019:
Operator X: https://[redacted]tt/en/mobile/plans-services/prepaid.html
Operator Y: https://[redacted]tt/mobile-4-2-2/#preunlimited

Table 5: Residential post-paid mobile plans (TT$)

Concessionaire	Product	Monthly subscription price (TT$)	Data allowance	Call allowance	SMS/MMS allowance
Operator X	Post-paid Unlimited 350	350	Unlimited data	Unlimited local + 300 anywhere minutes	Unlimited worldwide
	Post-paid Unlimited 550	550	Unlimited data	Unlimited anywhere minutes	Unlimited worldwide
	Post-paid Unlimited 750	750	Unlimited data[56]	Unlimited anywhere minutes	Unlimited worldwide
Operator Y	Lite	111	250 MB	205 minutes	Unlimited worldwide
	Everything 199	224	3 GB	300 local minutes + 20 international minutes	Unlimited worldwide
	Everything 299	336	4 GB	500 local minutes + 50 international minutes	Unlimited worldwide
	Post-paid unlimited	393	Unlimited	Unlimited local minutes	Unlimited worldwide
	Everything 399	449	Unlimited	Unlimited local + 100 international minutes	Unlimited worldwide
	Everything 525	591	Unlimited	Unlimited local minutes + 200 international minutes	Unlimited worldwide
	Premium	674	Unlimited	Unlimited local minutes + 150 international minutes	Unlimited worldwide

Source: The following concessionaire websites, accessed February 13, 2019 —
Operator X: https://[redacted]tt/en/mobile/plans-services/post-paid.html
Operator Y: https:/[redacted]tt/mobile-4-2-2/#posteverything

[56] This plan includes an additional roaming allowance compared to the postpaid Unlimited 550 package (2 GB of data allowance to be used in the USA).

Whilst the absolute price of post-paid plans is typically above that of prepaid plans, this reflects the higher usage allowances in those plans. Indeed, end users whose usage is in the range for which prepaid and post-paid plans are both offered may consider the two as substitutes. This, however, is less likely to be the case for lower-usage customers, who may struggle to find suitable post-paid offers available (as the smallest post-paid bundle offers a combination of monthly allowances which is similar to the largest allowances on prepaid plans).

A detailed look at the price ranges of prepaid and post-paid offers available suggests that Operator X's and Operator Y's most expensive prepaid plans (i.e., *Quick Pick Option 1* for TT$349 and *Prepaid Plan 4* for TT$393, respectively) match Operator X's cheapest post-paid plan (i.e., *Post-paid Unlimited 350* for TT$350), with similar monthly allowances. Operator Y also offers three cheaper post-paid plan options (i.e., *Lite* at TT$111, *Everything 199* for TT$224 and *Everything 299* for TT$336), although with lower monthly allowances than the plans above. This suggests that there is a non-trivial overlap in the prepaid and post-paid tariff plan offerings in Trinidad and Tobago, which would facilitate substitution between these services.

The Authority concludes that prepaid and post-paid services have very similar characteristics and similar prices for a given level of usage. What differs is the target group of end users and their willingness to pay. However, it seems reasonable to assume that, if a SSNIP were to be implemented by a hypothetical monopolist on prepaid plans, some end users might decide to switch to post-paid contracts and vice versa. This particularly holds for post-paid end users who could, should the post-paid offers increase in price, switch to prepaid offers without necessarily being disadvantaged, as they could combine multiple prepaid plans or purchase multiple SIMs, as some mobile end users may be doing already.

This suggests that, despite certain limitations, prepaid and post-paid mobile plans can be considered as demand-side substitutes.

3.3.2. Supply-side considerations

In general, domestic prepaid and post-paid mobile services are likely to be supply-side substitutes, as they offer the same core functionality (i.e., they allow the end user to make and receive calls, send and receive SMS and access the Internet). As a result, the network infrastructure and the technology required to deliver them do not differ between prepaid and post-paid services.

Sales channels for prepaid and post-paid channels coincide as both concessionaires require end users to apply and register in person in a retail outlet. Prepaid bundles, bill payments and credit top-ups can be purchased online or over the phone via the concessionaire's customer service centre, as well as from third-party suppliers, such as small retailers, petrol stations, and supermarkets, among others. This would suggest that concessionaires require a retail sales network for either prepaid or post-paid services and, thus, there are unlikely to be high costs associated with switching from supplying one service to another[57].

Finally, although there are a few differences in terms of network infrastructure and billing — with the provision of post-paid (but not prepaid) services requiring billing, revenue collection and bad debt management — the cost of these activities does not appear to be sufficiently large to represent a barrier to supply-side switching. Therefore, in the event of a SSNIP by a hypothetical monopolist offering prepaid services, a supplier of post-paid services could switch to the supply of prepaid services and vice versa, without substantial additional expenditure or investment.

3.3.3. Conclusions

On the demand side, post-paid end users, on average, spend and use more than prepaid end users[58], and are subject to more stringent credit requirements. However, the functionality of both service types is identical. Consequently, the Authority does not consider that customer

[57] The Authority notes that postpaid subscriptions are subject to higher administrative requirements (for example, due to the need to undertake credit checks or other verification processes for new customers) but considers that the associated costs are likely to be immaterial compared to network costs.

[58] As measured by ARPU over time, as well as usage across all services

segmentation for mobile services is clear cut but, rather, considers that there is certain overlap between the prepaid and post-paid products, particularly at the higher-end of prepaid services and entry-level post-paid services, the terms (i.e. the level of spend and bundled volumes) of these services, tend to be similar or competitive. Therefore, the Authority concludes based on the assessment above prepaid and post-paid mobile services are in the same product market.

Additionally, prepaid and post-paid mobile services are also deemed to be supply-side substitutes, as the nature of the service offered, and underlying infrastructure are comparable. Therefore, both concessionaires could switch from offering one to the other in case of a SSNIP.

3.4. Are Residential and Business Services in the Same Product Market?

The OECD 2014 Guidelines on Defining the Relevant Market in Telecommunications[59] suggest that, depending on the product, some business users have very different needs to residential users. However, not all businesses might fit into a single category, given their differing nature and size. For example, when considering fixed telecommunications in particular, it is possible that small and medium enterprises (SMEs) will have needs more similar to those of residential users than large enterprises[60]. Large multinational firms, on the other hand, typically have more complex and often bespoke needs. In the case of mobile services, for example, a potential special requirement for larger business users might be being able to communicate within a closed user group (CUG).

The focus of this subsection is, therefore, to assess whether retail domestic mobile services provided to residential and business end users should form part of the same product market in Trinidad and Tobago. In doing so, the Authority again considers end users' characteristics and

[59] https://www.oecd.org/daf/competition/Defining_Relevant_Market_in_Telecommunications_web.pdf

[60] For example, in the New Zealand Commerce Commission's decision to clear the merger between Vodafone and TelstraClear, the Commission found that the telecommunications products purchased by certain categories of businesses (businesses operating from home and small business with their own premises) form part of the residential market, as they are typically equivalent to products purchased by residential end users.

Commerce Commission, New Zealand (2012), Vodafone New Zealand Limited and TelstraClear Limited (2012) NZCC 33. Available at: https://comcom.govt.nz/__data/assets/pdf_file/0027/76176/NZCC-33-2012-Vodafone-TelstraClear-clearance-public-decision-29-October-2012.pdf

how these affect their inducements and ability to switch between each group of services, as well as the implications for the concessionaires' supply of such services.

3.4.1. Demand-side considerations

The first consideration in the Authority's demand-side analysis is a comparison of the characteristics of services offered to residential end users with those offered to business end users.

3.4.1.1. Product characteristics

From submissions received from both concessionaires, the Authority notes that there are some potential differences in the characteristics and requirements of business and residential users of domestic mobile services in Trinidad and Tobago. For example, business users may be more sensitive to quality of service levels. Indeed, Operator X's qualitative evidence submission[61] reports that *"*corporate end users place even greater focus (than retail end users) on service resiliency and customer aftercare". Equally, Operator Y declares that "corporate/business service demand is channelled via a specific sales team"[62].

In addition, business users can require solutions specific to their needs, such as managed Wi-Fi, managed security and unified communications across mobile and fixed services[63].

However, these differences may not be sufficient to prevent demand-side substitution between business and residential mobile services. This is particularly the case for small businesses, which are unlikely to have the same demand characteristics as described above for (large) corporate end users.

[61] Qualitative evidence submitted by Operator X, March 2019

[62] Qualitative evidence submitted by Operator Y, December 2018

[63] This is also documented in the qualitative evidence submitted by Operator X.

Furthermore, it is reasonable to assume that it is difficult for the concessionaires to prevent business end users from signing up for residential services, and vice versa. This is particularly true for small businesses, which could easily register as retail end users using their home address rather than their business address, especially as they are also less likely to require business-specific solutions. Larger businesses, on the other hand, would find it more difficult to register as residential end users. However, as mobile devices are given to individual staff members, this is likely to reduce any potential differences in the use case relative to residential end users.

As part of its submission, Operator Y explained that it is able to distinguish between customer types based on a series of checks to verify the user's status, service location and demand for advanced ICT solutions[64]. However, the Authority considers that this could be difficult to enforce for small businesses, for the reasons explained above.

Operator X, instead, stated that "there is no obligation for corporate end users to take business products", and that this results in "fierce competition in the corporate side of the business from both Operator X's own retail offering and the offering of its competitors, particularly in the growing base of SMB/SOHO[65] end users".

Figure 3 suggests that Operator X puts more emphasis than Operator Y does on business end users, who represent a consistent (but decreasing) share of the former's post-paid mobile end users (from 60% in January 2016 to 47% in 2018), whilst Operator Y's share of business customers among its total post-paid end-user base has remained in the 20% – 22% range during this period[66].

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[64] Based on the following responses to data requests issued by the Authority:

"Corporate/business clients are distinguished by the following: (i) The customer's status as a registered business (based on documents such as VAT Registration Number, Company Registration Number, etc); (ii) The service location (whether it is commercial or residential) and (iii) The customer's demand for advanced ICT solutions and these demands are subject to higher Service Level Agreements.

Residential end-users are distinguished by the following: (i) The customer's status as a private citizen and not a business; (ii) The service location (whether is commercial or residential); (iii) The customer's service request; and (iv)The customer's consumption patterns".

[65] Small office/home office (SOHO) is a term used to refer to small businesses, many of which operate out of homes. SMB refers to small and medium-sized businesses.

[66] The difference observed between both concessionaires may, in part, be a result of Operator Y not offering mobile data-only services for business end users.

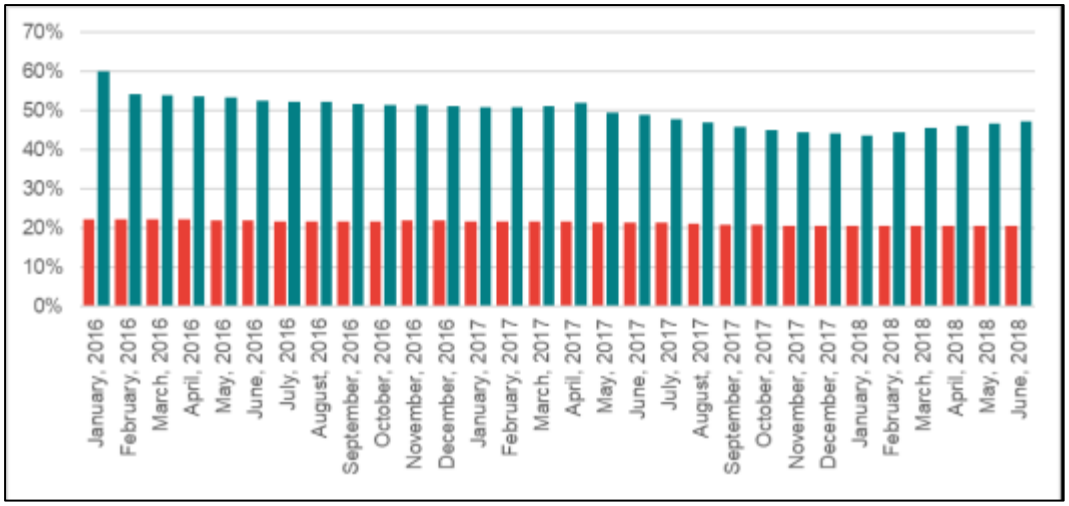

Figure 3: Share of business subscribers in total post-paid connections for Operator X and Operator Y

Source: Concessionaire data submitted to the Authority (December 2018 – January 2019)

Note: This covers both mobile bundled subscribers and mobile data-only subscribers.

In summary, the evidence available suggests that, although the features of demand for residential and business customer segments might present some differences, the possibility of some demand substitutability exists. Operator X, which appears to be more focused on business end users, offers those customers the same set of product plans as residential end users. Operator Y, on the other hand, distinguishes end users based on a set of checks.

However, the Authority understands that, in practice, this could be difficult to enforce for small businesses, which may result in small businesses, in practice, using residential tariff plans[67]. Indeed, the Authority believes that small businesses could consider residential offers to be viable substitutes for a number of reasons. For example, they might represent a more cost-effective way to meet their demand, and they include prepaid plans (which are not available for business-specific plans).

[67] For instance, small business or home office owners are likely to use a mobile connection for both business and personal purposes. In these cases, it is reasonable to assume that it is difficult for the mobile service providers to prevent business users from signing up for residential services, or vice versa. This is particularly true for small businesses which could easily register as retail end users, using their home as residency rather than their business site, especially as they are also less likely to require business-specific solutions.

3.4.1.2. Uptake and usage trends

Two services exhibiting opposing demand trends over time may, under certain conditions[68], be an indication that those services are, to some degree, demand-side substitutes. However, Figure 4 shows, overall, limited net substitution between residential post-paid and corporate post-paid subscriptions[69]. In particular, the number of residential subscriptions increased gradually until January 2018, while the corporate segment has been largely stable since January 2016. Therefore, no strong conclusions can be derived from this figure.

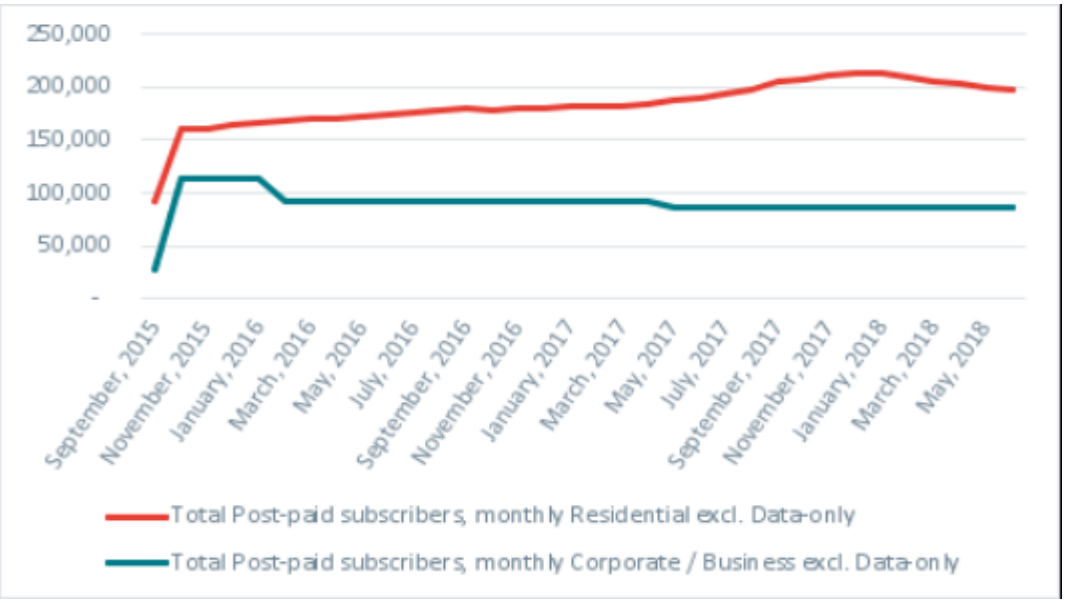

Figure 4: Residential versus business subscriber numbers

Source: Concessionaire data submitted to the Authority (December 2018 – January 2019)

3.4.1.3. Relative prices

There is limited available data on tariff plans offered to business end users publicly, as these are not published on the concessionaires' websites. Instead, these customers are managed by

[68] I.e. stable demand for both services and a relative price change during the period under consideration. Note that opposing demand trends alone are not sufficient to indicate substitution; completely unrelated services can exhibit opposing trends but not be in the same market. Equally, an absence of opposing demand trends does not necessarily show that services are not substitutes.

[69] Prepaid subscription volumes cannot be compared between residential and business end users as business end users can only access postpaid contracts.

a dedicated sales team, with prices being negotiated bilaterally. This is not the case for residential tariffs, which are published on concessionaires' websites. As such, business end users are able to compare their tariff plans to those available to residential customers and could switch from the corporate to the residential segment, if desirable, as it is difficult for the concessionaires to check to which segment end users belong. Indeed, Operator X's statements above on fierce competition between residential and business customer segments suggest that there is demand substitutability between residential and business offers.

3.4.2. Supply-side considerations

In general, domestic mobile services for residential and business end users are likely to be supply-side substitutes, as the same network infrastructure and inputs are used to deliver both services.

There are, however, a few differences in the retail marketing and customer service activities used for residential and business segments. In particular, larger business customers are likely to be offered greater levels of customer support, such as dedicated customer service representatives or specific marketing channels. For example, both Operator Y and Operator X explain that separate sales teams are assigned to residential and business end users (or prospective end users)[70].

However, the investments and changes to the sales team structures, which are required in order to market to, and service, these customer segments, do not appear to be sufficiently large to represent a barrier to supply-side switching. Therefore, in the event of a SSNIP by a hypothetical monopolist offering residential services, a supplier of business services could

[70] Based on Operator Y's qualitative RFI submission

switch to the supply of residential services, and vice versa. This is in line with the recent market definition exercises performed in the Bahamas[71], Bermuda[72] and Oman[73].

3.4.3. Conclusions

From a demand-side perspective, there is some limited evidence to support demand-side substitution, as some business end users, particularly SMEs, may be able switch from business to residential service offerings[74]. From a supply-side perspective, the two products are supply-side substitutes, since similar inputs are used to deliver both business and residential services. There appears to be some difference in sales channels, but these are not likely to be sufficient to impede substitution in the event of a SSNIP from a hypothetical monopolist.

Given the information available and having considered the differences between the two customer segments in terms of both demand and supply, the Authority, therefore, concludes that residential and business services appear to be substitutes. Therefore, it is reasonable to conclude that mobile services offered to residential and business users belong to the same product market for domestic mobile services.

[71] The presentation linked below shows that there is no separation between business and residential mobile voice and data services:

https://www.itu.int/en/ITU-T/Workshops-and-Seminars/bsg/201703/Documents/6%20-%20RSF%20for%20BSG%20Trinidad%20and%20Tobago%20-%20Bahamas%20SMP%20Presentation%20(002).pdf

[72] https://rab.bm/documents/preconsultation-market-review-a-pdf-2/?wpdmdl=11768&refresh=5c8bae277b51c1552657959

[73] The latest Market Definition and Dominance Report, linked here, shows that retail mobile services have been defined as belonging to a single market, with no separation between the business and residential segment:

https://tra.gov.om/pdf/8-mdd-Report.pdf

[74] Vice versa would not be formally possible for Operator Y end users, but there would also be no incentive for residential users to switch to business offers, as these are typically either more expensive or inclusive of services which are not relevant for residential users.

3.5. Key Conclusion

Within this section, the Authority has considered whether retail mobile access forms a product market on its own (i.e., mobile access-only products) or should be widened to include any of the other domestic mobile services, such as domestic call, messaging and data services. The Authority has further assessed whether there are separate product markets for prepaid and post-paid offerings and services provided to residential and business users.

Having considered both demand-side and supply-side considerations in each case, the Authority concludes that all these services form part of a single product market for retail domestic mobile services. This conclusion is based predominantly on all these services being supply-side substitutes and is in line with international precedent from the Caribbean, European and GCC regions, amongst others.

4. Assessment of the Need to Extend the Market Beyond Mobile Services

Section 3 presented the Authority's determination of which domestic mobile services should form part of the relevant market. The purpose of this section is to assess whether that market also includes services other than traditional mobile voice and SMS services. In particular, the Authority considers whether:

(i) retail fixed voice and/or broadband services should form part of the same product market as retail domestic mobile services.
(ii) OTT voice and messaging services should form part of that product market.

As was done in section 3, in examining these questions, the Authority assesses demand-side and supply-side factors.

4.1. Are Retail Fixed Voice and Domestic Mobile Voice Services in the Same Product Market?

Domestic voice services accessed via mobile and fixed devices share some functional similarities in that they both enable end users to receive calls and call other end users on both mobile and fixed devices. However, there are also non-trivial differences between them, both in terms of price and non-price characteristics and how the services are delivered to end users.

4.1.1. Demand-side considerations

Domestic fixed voice services may, to some extent, be demand-side substitutes for mobile access and domestic call services. However, for the reasons set out below, the Authority considers that the actual extent of this substitution is likely to be limited.

4.1.1.1. Product characteristics

In terms of product characteristics, both fixed line and mobile access and domestic call services allow end users to make and receive calls to and from other end users of fixed and mobile

devices. However, there are still significant differences in the product characteristics which are likely to constrain the substitutability of mobile services with fixed services.

A significant limitation to demand-side substitutability between these services is the underlying difference in mobility. Domestic mobile services are not fixed to a determined geographic location[75] and are specific to the end user, whilst domestic fixed voice services are tied to a location, typically in the home, and are often consumed by more than one user within a specific household. The flexibility offered by domestic mobile services appears to be an important factor for end users in Trinidad and Tobago. For example, more than 70% of all respondents to the TATT-CMR Survey state mobility as the most important advantage of their domestic mobile service compared to fixed voice services (see Table 6).

This supports the hypothesis that most mobile service end users in Trinidad and Tobago would be unwilling to compromise on the mobility feature. This, in turn, would prevent significant levels of switching away from domestic mobile services to domestic fixed services, in the event of a SSNIP for domestic mobile services[76].

[75] Mobile end users' ability to make and receive calls depends on the extent of mobile network coverage. However, the Authority understands that complete geographic coverage is available in Trinidad and Tobago.

[76] Since there is a higher chance of contacting someone via their mobile device rather than a fixed line (as the latter requires them to be at home), this benefit may also limit switching away from mobiles entirely (even if end users were to reduce their usage).

Table 6: "Comparing your current mobile access and call plan to a fixed landline service, what are the three key advantages of your mobile plan?" (Top five responses by count)

Order of importance	**1st**	**2nd**	**3rd**
Mobility	657	104	25
No other advantages	-	449	239
Quality of service	132	201	62
Price	106	103	45
Service availability	11	30	90

Source: TATT-CMR Survey

Moreover, as discussed in sub-section 3.1, domestic retail mobile services in Trinidad and Tobago are predominantly purchased as part of a bundle comprising the mobile access service and allowances for calls, messaging and data services. This is not currently the case for retail domestic fixed services in Trinidad and Tobago.

Whilst the three major fixed concessionaires — Operator X, Operator Z and Operator Y — all offer end users the option to subscribe to domestic fixed voice services, either as a standalone voice plan or as part of a bundle with fixed broadband services, end users often purchase fixed voice and broadband services separately.

Mobile end users who value access to all of these services using a single device and tariff plan rather than having to purchase them separately, and therefore, subscribe to bundles, are unlikely to give up the entire bundle in favour of subscribing to use fixed services instead, in the case of a SSNIP.

4.1.1.2. Service availability and uptake

Both domestic fixed and mobile voice services are available throughout Trinidad and Tobago. Fixed voice uptake (penetration) by June 2018 was 67%[77] of total households, and the mobile equivalent was 150%[78] of total population[79]. This suggests a sizeable proportion of the population in Trinidad and Tobago are likely to have access to both domestic mobile and fixed services, which would allow them to consider switching between these services on a call-by-call basis, if they wish to do so[80]. As stated earlier, opposing trends in the uptake of two services may be a result of services being substitutes. However, this is not clearly reflected in the observed trends of uptake or average usage for fixed and mobile services as shown in Figures 5 and 6.

[77] Source: https://tatt.org.tt/DesktopModules/Bring2mind/DMX/Download.aspx?Command=CoreDownload&EntryId=1173&PortalId=0&TabId=222, accessed May 15, 2019

[78] Ibid.

[79] The Authority notes that significantly higher penetration rates for mobile compared to fixed are not surprising and are, in fact, typical. This is largely a result of: (i) there rarely being a reason to have multiple fixed lines in one residential premise, and (ii) many people having more than one mobile device (for example, separate work and personal phones). In addition, some households will not have access to a fixed line but would still be covered by mobile services.

[80] However, the Authority also notes that this is not the case for 33% of the total households, as they currently are not subscribed to fixed line services. These households would need to first acquire a fixed voice service in order for the end user to be able to consider switching between these services on a call-by-call basis. An assessment of the prevailing differences in the price and non-price terms discussed above and below suggests this is unlikely.

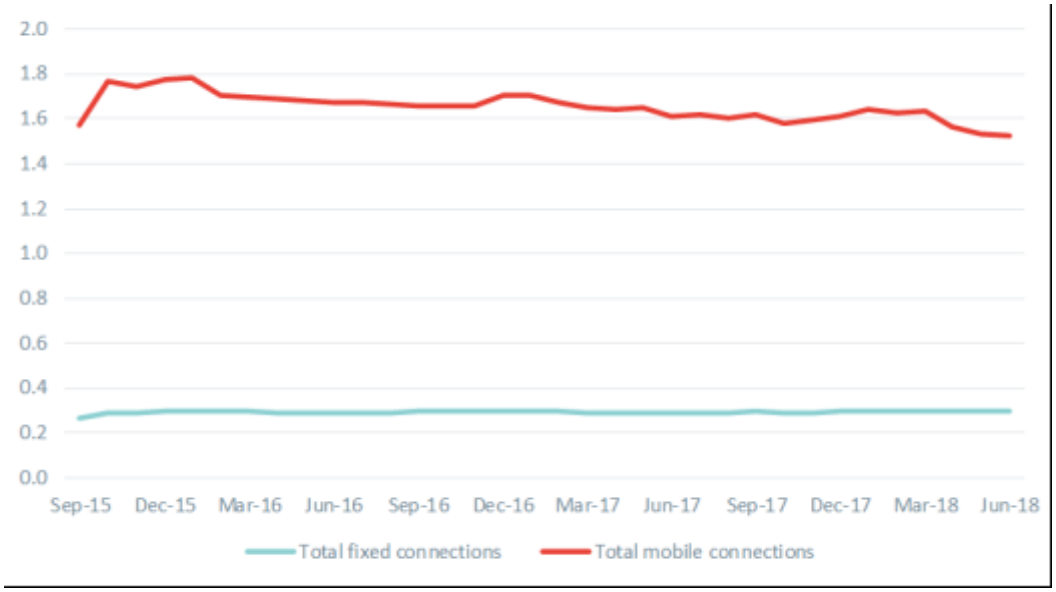

Figure 5: Fixed versus mobile connections (mln)

Source: Analysis based on data provided to the Authority (December 2018 – January 2019)

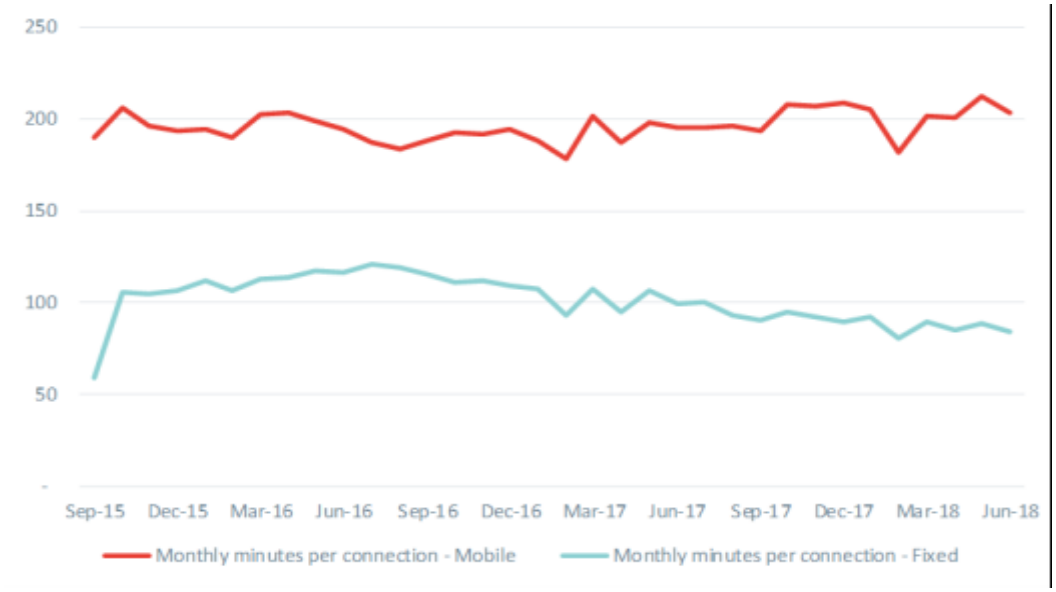

Figure 6: Average monthly domestic call minutes per fixed/mobile connection

Source: Analysis based on data provided to the Authority (December 2018 – January 2019)

The Authority, in reflecting on the evidence presented above, considers that the monthly fluctuations do not provide any relevant insight about usage of the two types of service (for example, whether they exhibit substitutability traits). Most fluctuations appear to be seasonal, with some peaks and troughs occurring in the same direction simultaneously. Given this, there does not appear to be sufficient evidence available on uptake rates and usage trends to support a conclusion on whether there is demand-side substitution between domestic mobile and fixed retail services in Trinidad and Tobago.

4.1.1.3. Relative prices

In order to ensure that prices are compared on a like-for-like basis, it is important to distinguish between line rental/access and domestic call prices. Furthermore, it is important to distinguish between prepaid and post-paid mobile plans.

Sub-section 3.3.1.3 describes how end users on prepaid mobile plans can use pre-loaded credit to pay for usage either on a PAYG basis or via purchasing discounted bundles. For example, as shown in Table 7, Operator X and Operator Y both offer unlimited SMS, unlimited data and unlimited local minutes for TT$349 (Operator X) and TT$393 (Operator Y). Similar packages with more limited allowances are priced from TT$200 and TT$242 for Operator X and Operator Y, respectively.

Post-paid mobile users pay monthly fees for plans that include some combination of domestic and/or international calls, SMS/MMS and a data allowance. For example, as shown in Table 7 Operator X offers unlimited data, local minutes and SMS, and 300 international minutes for TT$350, while Operator Y offers a similar package but excluding international minutes, for TT$393. Bundles with smaller allowances are priced between TT$350 and TT$750 for Operator X and TT$111 and TT$674 for Operator Y.

The above prices for prepaid and post-paid mobile plans compare, for example, against a fixed voice bundle from Operator Z that is available for TT$145 per month. This includes unlimited domestic fixed-to-fixed calls and 1,800 minutes of fixed-to-mobile calls. A fixed voice bundle

from Operator Y is available for TT$197 per month, including unlimited minutes to both domestic landlines and mobiles[81]. Prices for packages that include minimal amounts of mobile-to-fixed minutes are also available, starting at TT$111 for 600 mobile-to-fixed minutes offered by Operator Z.

Based on the relative prices above, it appears that both the average prepaid and post-paid mobile end user would be able to meet their monthly demand for calls at a lower cost when using a fixed bundled service. In particular, an average prepaid mobile end user consumes around 160 minutes of calls per month, which costs, at a minimum, TT$250 with Operator X and TT$242 for Operator Y, while an average post-paid mobile end user consumes around 360 minutes per month and needs to spend, at a minimum, TT$350 with Operator X[82] and TT$336 with Operator Y.

[81] Concessionaires' websites suggest that fixed voice services are postpaid only and there are no prepaid options available.

[82] It is important to note that, based purely on a comparison of the fixed voice bundle charges and mobile bundle prices, it is unclear whether a significant group of end users of either prepaid or postpaid mobile services would switch to fixed voice services in the event of a SSNIP on domestic mobile services. This assessment would depend on the distribution of the usage patterns of end users, for which data are unavailable. In the absence of this data, it is not possible to assess at what relative price points end users would begin to see fixed services as a more cost-effective alternative to mobile services. More price-sensitive end users are the most likely group of end users to switch in the event of a SSNIP because a switch from one service to another, based on price, implies some trade-off against other factors that have informed their current choice of service (including the extra mobility and wider range of services offered by mobile services, as discussed above).

Table 7: Comparison of selected fixed and mobile plan prices

Type of plan	Monthly price (TT$)	Calls	Messages	Data
Mobile prepaid	349	Unlimited local	Unlimited	Unlimited
Mobile post-paid	350	Unlimited local	Unlimited	Unlimited
Fixed	197	Unlimited domestic	-	-

Source: The following concessionaire websites, accessed February 13, 2019

Operator X: *https://[redacted]tt/en/mobile.html*
Operator Y mobile: *https://[redacted]tt/mobile-4-2-2*
Operator Y fixed: *https://[redacted]tt/landline-2/[redacted]*

With respect to domestic call prices, which apply when end users exceed their monthly call allowance, the Authority has again considered the difference between prepaid and post-paid plans in pricing mobile domestic calls, and the pricing of fixed originated domestic calls (shown in Table 7). This is to assess whether there may be demand-side substitution between call services on an individual/marginal call basis (rather than end users switching between overall bundles).

For prepaid mobile plans, Operator X offers PAYG rates of TT$1.15 per minute for mobile-to-mobile and mobile-to-fixed domestic calls and Operator Y offers TT$1.10 (see Table 8). However, the effective unit prices of calls offered as part of prepaid and post-paid mobile plans are lower than this, as discussed below.

For post-paid mobile plans, Operator X has bolt-on offers in addition to its mobile post-paid plans, with 100 additional minutes costing TT$50, equating to TT$0.50 per minute (assuming that a customer uses all these minutes). Operator Y's post-paid, out-of-bundle mobile domestic calls may be more expensive depending on usage, with additional calls charged at TT$0.65 per minute but without a requirement to purchase bolt-on's in advance.

When post-paid mobile plans include a certain volume of domestic calls in the monthly subscription charge, the effective domestic call rates are typically lower. For example, some of Operator Y's post-paid mobile plans offer 500 minutes of domestic calls at a monthly charge of TT$336 for the entire bundle (including mobile access and the allowances for calls, SMS and data). Before considering the value of SMSs and data included in the bundle, this equates to TT$0.67 per minute (assuming that all minutes are used in a given month).

The above mobile domestic call rates compare against fixed domestic call rates that range from TT$0.15 to TT$0.45 per minute for fixed-to-fixed calls[83] and TT$0.75 to TT$0.90 per minute for fixed-to-mobile calls, depending on the call type.

Table 8: Comparison of selected domestic fixed and mobile out-of-plan call prices

Type of call	**Unit price (TT$)**
Mobile prepaid: PAYG rate	1.10 – 1.15/minute
Mobile post-paid: bolt-on effective rate and per-minute charge	0.65 – 0.67/minute
Fixed-to-fixed: PAYG rate	0.15 – 0.45/minute
Fixed-to-mobile: PAYG rate	0.75 – 0.90/minute

Note: All of these rates apply to calls to domestic fixed and mobile numbers.

Source: The following concessionaire websites, accessed February 13, 2019
Operator X: *https://[redacted]/tt/en/mobile.html*
Operator Y (mobile): https://[redacted]tt/mobile-4-2-2
OperatorY(fixed):https://tatt.org.tt/DesktopModules/Bring2mind/DMX/API/Entries/Download?Command=Core_Download&EntryId=1239&PortalId=0&TabId=222

Differences in non-price characteristics are likely to outweigh price differences and indeed limit the substitution observed in practice. In particular, end users in Trinidad and Tobago, in line with other jurisdictions, place significant value on the mobility of mobile services (as

[83] Excluding the rates which apply to on-net calls, which are typically cheaper and subject to complications around unlimited on-net calls offered in some cases

discussed earlier in this section). This is likely to constitute a high barrier to switching, as end users might not be willing to compromise on the ability to make and receive calls and messages when they are not at home.

End users who have access to both fixed and mobile services may be indifferent to making a marginal call from a mobile phone versus a fixed line whilst at home, based on the relative convenience and marginal cost of making a call from each device in those particular circumstances[84]. However, this is unlikely to be sufficient for mobile end users to switch away from a domestic mobile service to using only fixed services in the event of a SSNIP in domestic mobile services, due to the additional factors such as the importance of mobility discussed above. This is also supported by the switching evidence discussed below.

4.1.1.4. Further survey evidence

Figure 7 shows that only 1% of respondents to the TATT-CMR Survey (users of mobile services) state that the main use of their mobile phone is for making calls to fixed landlines. The prevalence of fixed-line voice services in Trinidad and Tobago suggests that many end users with a mobile phone also have a fixed landline. In other words, users of voice services in Trinidad and Tobago are likely to choose one service over the other (i.e., choose between making calls using a mobile or fixed service), depending on the context — for example, whether they are calling someone available on a fixed line or mobile (which may affect which is most cost effective to make the call from), and/or whether they are at home with access to a fixed line at the time.

This is in contrast to a situation in which end users decide between using either of the two services but not both. In many cases, the end user retains both a mobile and fixed service/subscription and uses both in different situations.

[84] The Authority has not been able to validate whether this holds for mobile end users in Trinidad, as it does not have the required usage data.

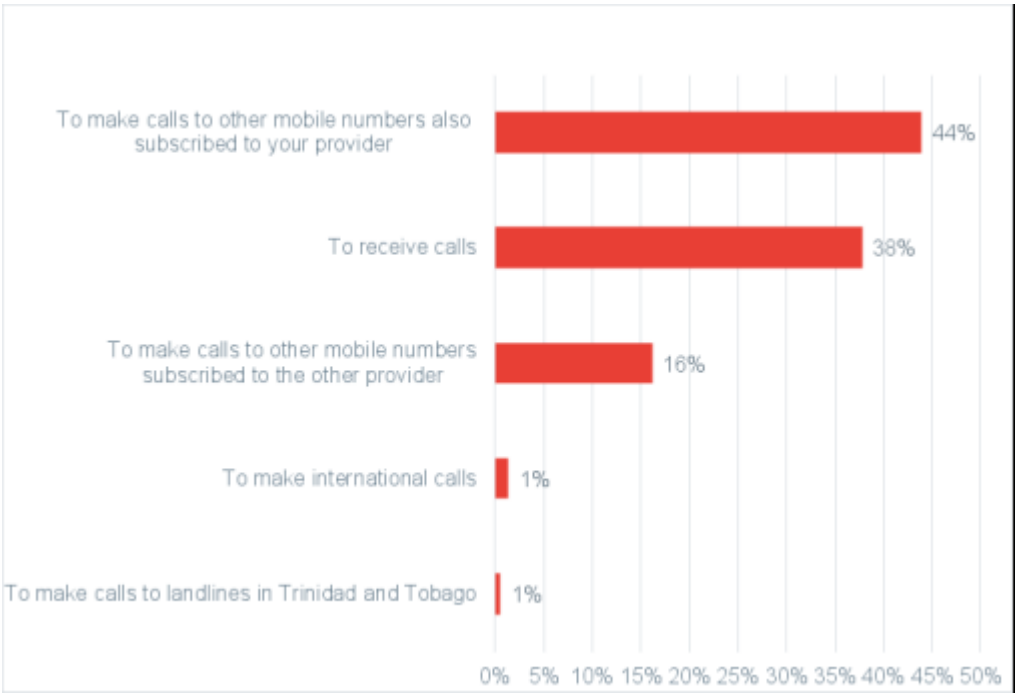

Figure 7: "For which of the following do you use your mobile phone mostly?"

Source: TATT-CMR Survey

4.1.2. Supply-side considerations

There is no supply-side substitution between domestic retail fixed and mobile services in Trinidad and Tobago. A hypothetical operator with only a fixed service licence would not be able to switch, easily and at low cost, to offering mobile telephony services. Both services use different network infrastructures, and the fixed investment cost and significant amount of time required to deploy a mobile network are considerable. Moreover, most of the costs would be sunk (i.e., they cannot be recovered if the entrant later decides to leave the market) and this creates additional barriers to entry.

Given the time, investment, need for spectrum and licence requirements, the Authority considers it highly unlikely that a concessionaire not already offering mobile services[85] would be willing and able to deploy a mobile network following a SSNIP in domestic mobile services.

4.1.3. Conclusions

Based on the assessment above, the Authority concludes that domestic fixed voice services do not form part of the same product market as domestic mobile services. For domestic mobile services, there is no supply-side substitutability, as these services are provided under distinct licences and are delivered via different network technologies. There is also likely to be only limited demand-side substitutability from mobile-to-fixed services, as end users consider it important to be able to use a mobile device to make and receive calls outside the home (which is not available with domestic fixed services).

[85] Two concessionaires, Operator X and Operator Y, provide both fixed and mobile retail services. However, the substitutability test concerns the ability of a provider that currently does not already offer the focal product (in this case, retail domestic mobile services), nor own any inputs which would only be required to offer the focal products, such as a mobile licence, spectrum or mobile network infrastructure, to start offering that product in the case of a 5% – 10% increase in the price of the focal product.

4.2. Are Fixed Broadband Services in the Same Product Market as Mobile Data Services?

End users can access the Internet through fixed broadband and mobile data services. Although there are two mobile concessionaires in Trinidad and Tobago, there are several major fixed broadband providers, and a number of smaller fixed players[86].

The concessionaires' websites show that mobile data and fixed broadband services are currently available on a standalone basis as well as bundled with other products[87].

4.2.1. Demand-side considerations

In theory, an Internet connection at a given speed, whether it is provided over a mobile data connection or fixed broadband, should offer the same functionality to an end user. However, there are differences between the services that are likely to restrict substitutability between fixed broadband and mobile data.

4.2.1.1. Product characteristics

There are significant differences in the product characteristics of fixed broadband and mobile data services. Those which are likely to limit substitution away from mobile to fixed services are set out below.

Mobile data services allow end users to access the Internet regardless of their location (assuming network coverage), while access to fixed broadband services is restricted to within a short distance of the router (almost always indoors). As for voice services, the mobility

[86] Mobile concessionaires, Operator X and Operator Y, along with the third major provider, Operator Z, also offer fixed broadband services. Smaller national providers of fixed services include: [redacted], [redacted], [redacted], [redacted], [redacted] (Trinidad) and [redacted]. There are also some smaller providers operating regionally.

[87] As discussed in previous sections, mobile bundles generally include mobile access, calls, SMSs and data services, whereas fixed concessionaires often bundle fixed voice and broadband services and sometimes pay-tv services.

appears to be an important factor for mobile data end users in Trinidad and Tobago. For example, the TATT-CMR Survey reveals that 73% of respondents stated "mobility" as the most important advantage of mobile data-only services compared to fixed broadband services[88].

In addition, fixed broadband is only available on a post-paid basis and subject to minimum contract lengths. This restriction is likely to constrain substitution for prepaid mobile data end users[89].

Some differences between these types of services are not likely to limit substitution away from mobile services, as described below.

Mobile data services are packaged differently from fixed broadband services. In particular, fixed broadband services are differentiated by download/upload speeds but have no usage allowances (i.e., they have unlimited data usage). Mobile data services, on the other hand, commonly have a usage allowance (which, if exceeded, would require an end user to pay extra or experience slower speeds), but the download/upload speed is commonly not advertised. This is related to the underlying differences in the network technologies over which the services are delivered, with network capacity being a key concern for mobile network concessionaires and download/upload speeds not being guaranteed[90].

[88] Whilst the fixed broadband penetration is high in Trinidad in Tobago (i.e., 80.4% of total households, as of Q4 2018), this does not mitigate the mobility difference between mobile data and fixed broadband services (i.e., the latter can still only be accessed within a home with a fixed broadband connection, whilst the former allows Internet access anywhere within a mobile network coverage area). The Authority recognises that there is an increasing presence of public Wi-Fi networks in Trinidad and Tobago. However, this also does not impact the mobility advantage of mobile data services over fixed broadband services, since it allows mobile data end users to offload their traffic only whilst in areas which currently enjoy Wi-Fi network coverage. For example, restricted rollout, password requirements and limitations on the terms of use may curb the extent to which users can offload their data traffic onto Wi-Fi networks.

[89] The ability of mobile users to offload data usage onto Wi-Fi networks may reduce the substitutability of fixed broadband, as it may lower the cost to mobile users of meeting a given level of demand for data usage. Future developments may, therefore, impact the substitutability of fixed broadband services. For example, an increase in the availability of public Wi-Fi hotspots could further reduce the likelihood of users switching from mobile data to fixed broadband services

[90] The speeds mobile end users experience depend, to a large extent, on the congestion on the relevant mobile cell site, which is likely to vary with the number of end users also utilising that cell site at the time.

Fixed network technologies allow the provision of higher (download/upload) speeds compared to mobile data services. For example, Operator Z offers the fastest advertised Internet connection speeds, of up to 600 Mbps, which is considerably higher than the maximum speed for mobile data services of 150 Mbps offered by Operator X (via a dongle). Similarly, there is a significant difference in actual observed download speeds, with average mobile download speeds of around 16 Mbps comparing to fixed download speeds of around 46 Mbps[91]. As such, this should not constrain potential substitution from mobile data services to fixed broadband services[92].

4.2.1.2. Service availability and uptake

As outlined previously, end users enjoy nationwide broadband coverage from mobile networks and, in many areas, fixed networks[93,94]. Fixed broadband service uptake in Trinidad and Tobago reached 80% of total households as of the second quarter of 2018,[95] which is high relative to the Caribbean region, and has increased significantly, by 12.7% year on year.

Both services are offered on a standalone basis and as part of a wider product bundle. The vast majority of mobile data service users in Trinidad and Tobago are using data services as part of a mobile bundle (i.e., 99% of data usage in 2018 comes from bundled contracts). This is likely to constrain the substitutability between fixed broadband and mobile data services, as these end users are likely to value the entire range of services offered as part of the relevant bundle and, thus, given the conclusion above that fixed voice and mobile voice services are not demand-

[91] Source (August 2019): https://www.speedtest.net/global-index/trinidad-and-tobago

[92] The Authority further notes that, although many mobile data users may have unlimited download allowances, this is almost always the case for fixed broadband services.

[93] Although nationwide 4G coverage in Trinidad and Tobago is currently only available from Operator X (as of July 2018), with Operator Y covering around 60% of the country, this still provides end users throughout the country with a choice between 4G mobile and fixed broadband services. In addition, 3G services are sufficient to support many applications (but at a lower speed) and are available throughout the country.

[94] Fixed broadband coverage is available nationwide via the three major concessionaires (Operator X, Operator Z and Operator Y) and the majority of smaller concessionaires.

[95] 2018 Q2 TATT quarterly update, available here: https://tatt.org.tt/DesktopModules/Bring2mind/DMX/Download.aspx?Command=Core_Download&EntryId=1173&PortalId=0&TabId=222

side substitutes, will be less willing to give up the entire mobile bundle and switch to a fixed broadband service, in case of a SSNIP in mobile services.

In addition, 51% of the relevant respondents to the TATT-CMR Survey stated that their mobile data-only/broadband connection[96] is not their only Internet connection, with 76% of these end users also having a subscription to fixed broadband services[97]. This suggests that a large number of end users prefer to use both mobile data and fixed broadband instead of viewing them as substitutes.

4.2.1.3. Relative prices

The advertised download speeds offered by the three main fixed broadband providers exceed those currently achieved on mobile data services in Trinidad and Tobago (i.e., 16 Mbps, as described in sub-section 4.2.1.1).

Operator X offers three standalone fixed broadband packages with maximum speeds ranging from 40 Mbps to 100 Mbps, priced between TT$249 and TT$400 per month, as well as four bundled packages, all of which include telephony, broadband and TV elements. The tariff range depends on the maximum upload speed (either 75 Mbps or 100 Mbps), and how many channels the bundled TV subscription includes. For these services, monthly prices range between TT$350 and TT$579.

Operator Z offers six standalone fixed broadband packages with download speeds ranging from 5 Mbps to 600 Mbps, and related prices ranging between TT$142 and TT$999 per month. Operator Z's offer also includes a choice of nine bundles of fixed broadband, telephony and (in most of the cases) TV services, with maximum download speeds ranging from 40 Mbps to 300 Mbps, with monthly tariffs within the TT$299 – TT$655 range.

Operator Y offers four standalone fixed broadband plans, with speeds ranging from 25 Mbps to 100 Mbps and prices ranging from TT$224 to TT$561 per month. Its additional six bundles

[96] In line with the low uptake of mobile data-only services, the relevant sample size was 132 out of 1,000 respondents (i.e., 13.2%).

[97] The remaining 24% access the Internet via mobile data services.

offer broadband combined with telephony and/or TV services (depending on the packages). Again, the speeds range from 25 Mbps to 100 Mbps, with monthly prices varying between TT$280 and TT$674.

However, when factoring in the differences in speeds[98], fixed broadband plans offer a cheaper means to access the Internet than mobile data services. For example, the cheapest available fixed broadband package to meet the 16 Mbps speed experienced on mobile data services is a 25 Mbps fixed broadband plan from Operator Y costing TT$224 per month. This compares to TT$350 per month for Operator X's Post-paid Unlimited Dongle/Mi-Fi Plan or TT$349 for bundled plans containing unlimited data allowances[99].

4.2.1.4. Switching evidence

Any evidence of end users switching, or indicating a willingness to switch, from mobile data to fixed broadband services is useful to inform any assessment of substitutability. As discussed earlier, opposing uptake trends over time can, in some cases, be indicative of demand-side substitution. However, this is not clearly reflected in the observed trends of uptake of fixed broadband and mobile data services in Trinidad and Tobago. Figure 8 compares the uptake trends of mobile data services (separately for mobile data-only and mobile data as part of mobile bundles) and fixed broadband services over time. This shows that the uptake of both mobile data services as part of bundles and fixed broadband services have increased recently.

[98] The Authority acknowledges that the comparison of achieved (mobile) and advertised (fixed) broadband speeds may be an imperfect one, although it considers the comparison of a 25 Mbps advertised speed against an average achieved speed of 16 Mbps to be reasonable, for the purposes of assessing the fixed plan that a mobile user would need to choose in order to enjoy a user experience similar to that experienced using a mobile connection. This refers to data-only contracts as well as bundles.

[99] Lower-priced plans contain, at most, 3GB of data per month and, at TT$250 per month, do not cost significantly less than the plans containing an unlimited data allowance.

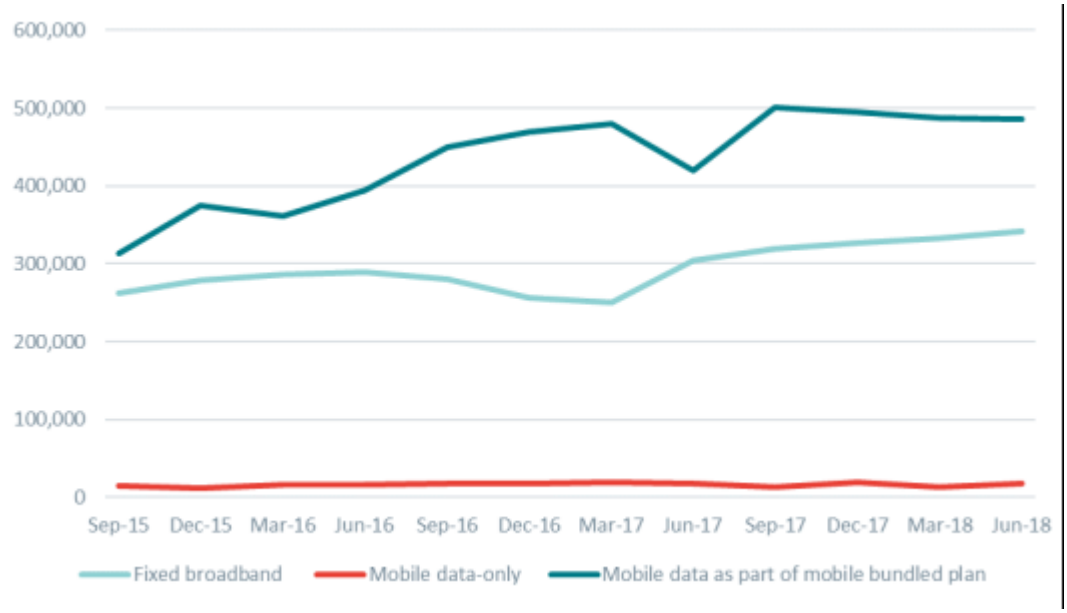

Figure 8. Comparison of Internet connections on fixed and mobile devices

Source: Analysis based on data provided to the Authority (December 2018 – January 2019)

Furthermore, for mobile data-only services, the TATT-CMR Survey reveals that respondents are almost five times as likely to switch to another mobile concessionaire in case of a price increase, compared to switching to a fixed broadband offering[100]. In particular, as shown in Figure 9, in the event of a small price increase, 10% of the survey respondents with a mobile data-only service stated that they would switch to a fixed broadband service, whilst 47% of the relevant respondents would switch to another mobile provider[101].

[100] This refers to data-only contracts as well as bundles.

[101] However, the survey does not reveal how users would behave if prices of services offered by all mobile broadband providers were to increase by the same amount. As part of the survey questionnaire design, there was a concern that, given its hypothetical and theoretical nature, asking the standard SSNIP test question to end users might have led to confusion and, hence, inaccurate responses. Instead, a simpler wording of the SSNIP question was used.

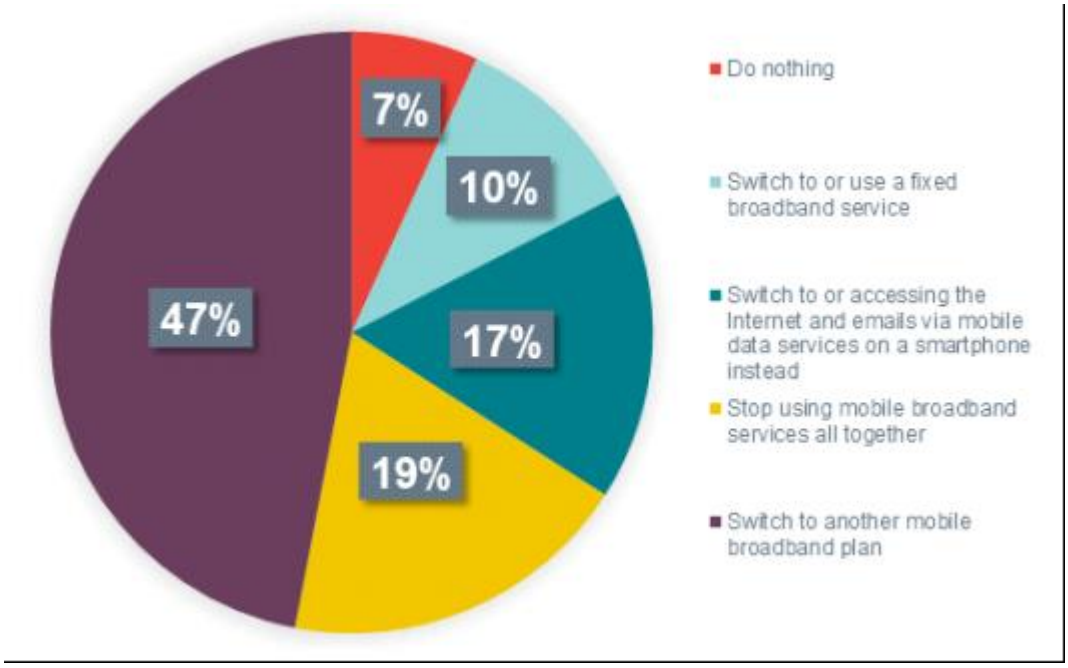

Figure 9: "Assuming that your mobile provider would start charging you TT$ 20 – TT$ 30 more per month for your mobile broadband plan, which of the following actions would you take?"[102]

Source: TATT-CMR Survey

The Authority notes that end users commonly aim to limit their data consumption on mobile bundles by using Wi-Fi networks when at home or where publicly available (i.e., Wi-Fi offloading). Whilst this could be considered a form of mobile-to-fixed substitution of data usage, end users are unlikely to give up their mobile data services altogether because of it (i.e., fixed services may be complements, to an extent, rather than perfect substitutes).

In summary, the available evidence suggests that mobile data and fixed broadband services may be seen by end users as comparable in terms of prices (as similar speeds are actually offered for a similar price). However, the differences in product characteristics — particularly the mobility of mobile data services — as well as the available switching evidence, strongly indicate that fixed broadband services are not considered to be demand-side substitutes for mobile data services at this time.

[102] Note that, in the TATT-CMR Survey, mobile data-only services are referred to as "mobile broadband" services.

4.2.2. Supply-side considerations

As in the case of domestic voice services, discussed in sub-section 4.1.3, there is no supply-side substitution between retail fixed broadband and mobile data services in Trinidad and Tobago. Both services use different network technologies, and require different service licences, as well as access to spectrum for mobile data services[103]. Given the requisite time, investment and licences, the Authority considers it highly unlikely that, following a SSNIP in mobile data services, a fixed licensee would deploy a mobile network and start offering mobile data services.

4.2.3. Conclusions

Based on the assessment above, the Authority concludes that retail fixed broadband services do not form part of the same product market as retail domestic mobile services. For mobile data services, there is no supply-side substitutability, as these services are provided under distinct licences and are delivered via different network technologies. There is also limited demand-side substitution, due to considerable differences in product features and end users' preferences. However, the Authority considers that significant increases in Wi-Fi accessibility can affect demand-side substitutability[104].

[103] In theory, providers could enter the mobile market as mobile virtual network operators (MVNOs) by accessing the mobile concessionaires' networks, or via co-location of equipment. Either of these may reduce the barriers to supply-side substitutability. However, the absence of any MVNO entry in Trinidad and Tobago to date suggests this business model is not a commercially attractive option for prospective providers of mobile services.

[104] The indoor requirement of the COVID 19 pandemic accentuated this fact as mobile customers would delay or reduce talk purchases given, access (80%) to fixed broadband network.

4.3. Are OTT Voice Services in the Same Product Market as Retail Domestic Mobile Voice Services?

The recent, widespread uptake of smartphones globally has facilitated the spread of OTT applications for communication purposes. OTT services provide messaging, voice and video-call services over the Internet. To use these services, end users must install the OTT provider's software/application (app) on their smartphone, which enables them to access the voice and messaging services that are transmitted as data packages (i.e., they use mobile data).

In sub-sections 4.3 and 4.4, the Authority evaluates whether OTT and mobile services belong to the same product market, considering voice and messaging services, respectively.

Whilst OTT voice services are offered at a significantly lower price than mobile voice services, limited substitutability from the demand side and supply side indicates that they do not belong to the same relevant market. This is explained below.

4.3.1. Demand-side considerations

The TATT-CMR Survey reports that when end users are asked to compare OTT and traditional mobile domestic calls, they state that traditional mobile calls generally have a higher price but also better service quality. In assessing demand-side substitution between these services, the Authority, therefore, considers differences in product characteristics, including the ability of users to make or receive calls across platforms, and the cost of switching from traditional mobile services to OTT services.

4.3.1.1. Product characteristics

OTT voice services (such as FaceTime or WhatsApp) are often not interoperable. This means a call can only be terminated on the same application on which it was initiated[105]. This generates network effects for individual platforms, as users have a greater incentive to join platforms with more subscribers.

Whilst some OTT apps, such as Skype or Viber, allow calls to fixed and mobile numbers, these typically attract a per-minute charge. Furthermore, no OTT apps allow users to receive calls originating from outside the platform (i.e. non-interoperability between OTT applications)[106]. This represents one of the challenges to demand substitutability between OTT and traditional mobile calls, as the former requires two users to either be on the same network or to both subscribe to traditional mobile services in order to make and receive calls.

Reliance on the speed and stability of an Internet connection further limits mobile calls' substitutability for OTT voice services. In particular, a poor Internet connection negatively impacts OTT calls and thus might result in users being forced to opt for mobile calls. Indeed, most survey respondents cited quality of service as the main advantage of mobile calls relative to OTT services[107].

These characteristics suggest that demand substitutability between these two products is unlikely to exist, as explored further in the following sub-section.

[105] This is also highlighted in the Authority's consultative document on dominance in termination markets (published in May 2018), available here (p.28, Sub-section 3.3.2.4): https://tatt.org.tt/DesktopModules/Bring2mind/DMX/Download.aspx?Command=Core_Download&EntryId=1091&PortalId=0&TabId=222

[106] Whilst this does not constrain end users in making calls, it may influence their overall view on whether the OTT service is a substitute for mobile services, as mobile users value both making and receiving calls.

[107] Although the concessionaires offer nationwide coverage across various technologies, end users have noted that the quality of service is sometimes a barrier to use of mobile data networks for some communication services; 60% of respondents cited "quality of service" as the main advantage of mobile voice services compared to OTT voice services.

4.3.1.2. Service availability, usage and uptake

Smartphones and tablets capable of connecting to the Internet via mobile data or Wi-Fi are common in Trinidad and Tobago, with 97% of the TATT-CMR Survey respondents owning at least one of these devices[108]. This provides a strong foundation for the widespread use of OTT services in Trinidad and Tobago.

As per the TATT-CMR Survey, the most common uses of OTT services in Trinidad and Tobago are third-party mobile app-based voice and video calls (83%[109]) and third-party mobile app-based messaging (77%)[110]. In general, communication by this means requires that both parties (sender and receiver), have installed the same application on their devices and have access to a good Internet connection. However, from a demand perspective, OTT and traditional mobile calls are more likely to be considered complements rather than substitutes.

Most OTT calls are likely to be originated by mobile bundled end users who have access to both traditional mobile calls and mobile data services within one subscription, and they are indicative of the large majority of data usage by prepaid and post-paid mobile end users in Trinidad and Tobago. This suggests, therefore, that the majority of end users who can access OTTs also have available to them traditional mobile services. Indeed, end users would be more likely to opt for traditional mobile calls when the recipient is not subscribed to a common OTT platform or if there is no Internet connection available (but mobile calls are possible). On the other hand, they are more likely to use OTT services to communicate with other OTT platform members or where Internet connection is accessible (for example, where an end user is able to connect to Wi-Fi).

[108] TATT-CMR Survey

[109] TATT-CMR Survey results presentation, slide 65

[110] WhatsApp is the most popular OTT call and messaging service in Trinidad and Tobago, according to the TATT-CMR Survey. Other, less common, OTT applications include Skype, Google Voice, Viber and Facetime for making voice and video calls and iMessage or WeChat for messaging.

4.3.1.3. Relative prices

In general, OTT applications are downloadable either free of charge or entail a very low fixed fee (for example, WhatsApp previously cost US$0.99 per year and is now free), in most cases, with no applicable charge per call or message sent or received. Instead, end users face an implicit charge for the data usage required to make calls or send messages. For common-platform OTT calls, generally no charge is applied (other than any implicit cost for the data usage)[111]. Some OTT apps, however, such as Skype and Viber, allow calls to fixed and mobile numbers, which incur charges, depending on the length of the call. Tables 9 and 10 show, for example, that the OTT price for calls to a fixed landline in Trinidad and Tobago is aligned with prepaid PAYG charges[112], while OTT rates for calls to a mobile number in Trinidad and Tobago are considerably more expensive than the prices charged by the concessionaires.

Table 9: Calls to domestic mobiles, MNOs and prepaid PAYG offers versus OTTs

Provider	**Unit price (TT$)**
Operator X	1.15/minute
Skype	2.77/minute
Operator Y	1.10/minute
Viber	2.77/minute

Source: OTTs' and concessionaires' websites, accessed February 13, 2019

[111] The Authority notes that the prices of common-platform OTT services are significantly lower than the prices of traditional mobile services, sometimes with the direct marginal cost to the end user of a call or message being zero (although, depending on the subscription plan, there may be a non-zero marginal cost or opportunity cost of data incurred by the end user as a result of their use of the OTT platform). This is reflective of the business/operational plans of OTT service providers being significantly different from those of mobile concessionaires. This is also reflected in the higher prices for OTT calls to fixed or mobile numbers which incur a termination charge by the OTT provider to the relevant terminating party. Note that these remarks apply to both call and messaging services.

[112] The comparison focuses on prepaid PAYG and OTT call services, as both offer unit prices for calls to domestic mobiles and fixed lines.

Table 10: Calls to domestic fixed lines, MNOs and prepaid PAYG offers versus OTTs

Provider	**Unit price (TT$)**
Operator X	1.15/minute
Skype	1.16/minute
Operator Y	1.10/minute
Viber	1.52/minute

Source: OTTs' and concessionaires' websites, accessed February 13, 2019

Low or non-existent OTT app fees combined with free intra-platform calls provide end users with the opportunity to download such apps and use them only for the types of calls where it is the most convenient or cost-effective solution. The potential price differential between OTT and domestic mobile call services depends on the call scenario, with both services offering calls at zero marginal costs (i.e., intra-platform OTT calls over a Wi-Fi network or where an end user has unlimited data and mobile calls within their monthly allowance). This price differential also further depends on how much, if anything, the OTT end user has to pay for the data usage required to make the call. This will depend on whether that end user can use the data within his or her monthly allowance or uses Wi-Fi (in these cases, there is no extra cost), has to pay the out-of-bundle data charge or is on a PAYG plan.

4.3.1.4. Switching evidence

As shown in Figure 10, domestic mobile call volumes (both prepaid and post-paid) have been generally stable within the last three years and have not declined as demand for OTT call volumes is likely to have increased[113]. However, the observed trends neither support nor refute substitutability between both services.

[113] The Authority notes that data on the growth of OTT voice calls and minutes domestically were not available at the time of writing. Furthermore, it is noted that additional information would be required to assess how mobile traffic would have evolved in the absence of OTT services.

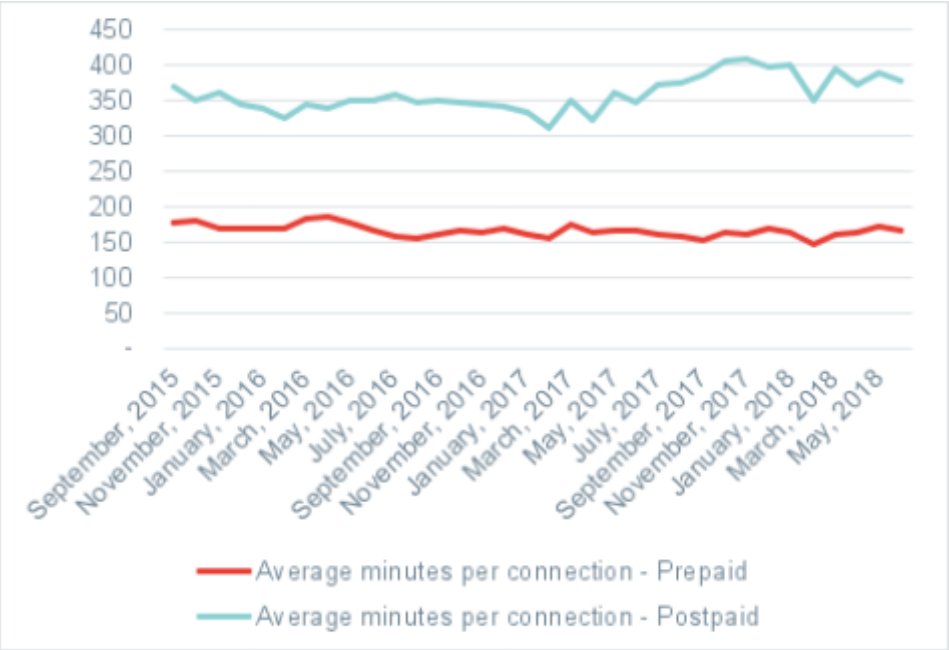

Figure 10: Average domestic call minutes per connection

Source: Analysis based on concessionaire data submitted to the Authority (December 2018 — January 2019)

This observation is further supported by the TATT-CMR Survey which revealed that, on average, 33% of all survey respondents would make fewer domestic mobile calls and instead make an increased number of OTT calls, if faced with a 5% – 10% rise in mobile call prices (compared, for example, to ceasing to use mobile voice services at all, or switching to another mobile provider)[114]. This response is higher amongst respondents with higher levels of consumption, as shown in Table 11. In particular, the share of respondents willing to switch to using OTT voice in case of a price increase in mobile call services drops to less than 26% for mobile users making fewer than 60 minutes of calls each week (representing 47% of the total respondents).

[114] Note that, in order for respondents to consider switching usage to OTT voice calls, they do not necessarily need to be already subscribed or have downloaded the relevant app. Therefore, the proportion of respondents willing to switch some usage in the event of a price increase may be higher than the proportion of respondents who currently use OTT services at all.

Table 11: Intention to substitute (some) mobile for OTT calls following a 5% – 10% increase in the price of mobile voice services

Band of mobile voice service consumption	**Share of total users in the consumption band**	**Share of users willing to switch to using OTT voice within each band**
Fewer than 20 minutes per week	13%	21%
Between 20 and 60 minutes per week	34%	26%
Between 60 and 120 minutes per week	24%	40%
More than 120 minutes per week	30%	39%
Weighted average		33%

Note: Figures may not necessarily sum to 100%, due to rounding.

Source: TATT- CMR Survey

Although this evidence suggests that a share of end users of mobile voice services do consider OTT voice services to be an option if mobile call prices were to increase, it is not appropriate to conclude that switching to these services would make 5% – 10% price increases unprofitable for a hypothetical monopolist (which is the requirement of the SSNIP test, in order to conclude that OTT voice services are in the same market as traditional voice services)[115]. In particular, the following considerations suggest that, in practice, the scope for end users substituting away from domestic mobile services to OTT services is low in Trinidad and Tobago[116]:

[115] It is noted that, in certain situations, end users may opt to use OTT services rather than traditional mobile services. Nonetheless, an assessment of whether services are substitutes does not only consider whether there would be any switching at all but also considers whether a sufficient degree of switching would occur, such that a hypothetical monopolist would find it unprofitable to increase prices by a significant amount of 5% – 10% (see SSNIP narrative in sub-section 2.1). Note that this applies to both call and messaging services.

[116] It is noteworthy that culture (consumer habits or preferences) may also contribute to domestic customers' switching patterns. For example, despite mobile number portability domestically, 2018 and 2019 mobile subscriptions figures highlight that persons are still holding more than one mobile subscription. Whereas, in the UK mobile number portability experience, all four of its GSM networks became largely equal subsequent to its introduction and prepaid packages, which became more competitive resulting in lower switching barriers.

a) Current OTT service penetration in Trinidad and Tobago appears to remain low, with only 13% of all survey respondents[117] reporting usage of these services[118].
b) The degree of substitution has not been significant, with 76% of OTT users stating that consumption of such services has not reduced their usage of traditional mobile services.
c) Mobile voice services still provide a perceived higher quality of service to end users than OTT services.
d) An increasing trend towards bundled mobile services might limit end users' awareness of changes in the price for individual components and, with it, the willingness (and cost) to substitute consumption between services.

4.3.1. Supply-side considerations

Similar to the analysis of the substitutability between mobile and fixed services discussed above, there is no supply-side substitution between OTT and mobile voice services in Trinidad and Tobago. This is due to the high barriers to entry to the mobile services market, in terms of the need to:

(i) obtain a mobile service licence.
(ii) gain access to mobile spectrum.
(iii) deploy mobile network infrastructure.
(iv) develop a retail distribution network.

[117] A total of 132 of the survey population responded in the affirmative.

[118] Given the length of time OTT services have been available in Trinidad and Tobago and the high uptake of mobile data services in recent years, the low usage of OTT services may be reflective of the degree of digital divide nationally. It is envisioned that OTT uptake will increase significantly in the near future. Therefore, the Authority reserves it right to conduct periodic and timely reviews of the market and all submarkets, in accordance with the Authority's regulatory functions and mandate.

Given the time, investment and licence requirements, the Authority considers it unlikely that an OTT provider would enter the mobile service market following a SSNIP in mobile voice services[119].

4.3.2. Conclusions

Based on the assessment above, the Authority considers that OTT voice services do not form part of the same product market as domestic mobile call services, since there is no, or limited, demand-side or supply-side substitution.

[119] It should be noted that supply-side substitutability specifically concerns the ability of a provider, who currently does not offer the focal product, to switch production/service provision to offer the focal product(s), which, in this case, are traditional mobile services (i.e., those services which are delivered directly over the mobile network and require a licence in the relevant country). Since OTT services do not meet these criteria, they are not considered to be supply-side substitutes to traditional mobile services. The requirement to provide traditional mobile services means that a provider would need either to operate their own mobile network or to operate as an MVNO using an MNO's network (i.e., using the infrastructure of one of the concessionaires), with both requiring a licence in the relevant country. The ability of OTT platforms/providers to pose a competitive constraint and, therefore, the consideration of whether they may belong in the same market as traditional mobile services, is captured in a test of demand-side substitutability, where one examines whether end users are likely to view these alternative services as viable substitutes to traditional mobile services in case of a SSNIP in the latter. Note that this applies for both call and messaging services.

4.4. Are OTT Messaging Services in the Same Product Market as Retail Domestic Mobile Services?

The Authority's analysis and conclusions on whether OTT messaging and mobile messaging services (i.e., SMS and MMS) belong to the same relevant product market are similar to those for voice services, discussed above. This is because of similarities in the underlying technologies and relative characteristics and restrictions of OTT and traditional services.

4.4.1. Demand-side considerations

The low OTT penetration in Trinidad and Tobago is likely to limit substitution between these services.

4.4.1.1. Product characteristics

OTT messaging applications often have additional functionality compared to traditional mobile messaging services. Indeed, OTT messaging has "instant messaging" features which are not available with traditional mobile messaging services. End users can, for example, see when another end user is online, when he/she is typing, when he/she last accessed the platform and (in some cases) whether their messages have been read.

However, sending OTT messages also requires that both parties share a common application (i.e., OTT messages can only be sent between users of the same app). As such, these services are more limited than OTT voice services which can also be terminated for a unit charge on fixed lines and mobiles.

Access to the Internet is another requirement. However, compared to voice services, effective communication through OTT messaging does not require that both sender and receiver simultaneously have a good Internet connection. Under extreme conditions of poor Internet connectivity or delayed Internet availability for the receiver, messages arrive late rather than fail to be delivered (although when messages are no longer pertinent, this is equivalent to non-delivery). This is not the case for traditional mobile messages (SMSs), which do not require an

Internet connection, only a minimum level of coverage. This could, therefore, limit substitution between both services; OTT messaging is free but less reliable, while SMSs might be subject to a charge but more likely to be delivered.

Indeed, respondents to the TATT-CMR Survey pointed out "quality of service" (which might include service availability) as the main advantage of mobile messaging compared to OTT messaging services, with 55% of respondents citing quality of service as the main advantage of mobile messaging services compared to OTT messaging services. This could again limit substitution. The stress on quality of service implies that there are different situations in which end users would choose to send one type of message or another. For example, SMSs are required in situations where no Internet connection is available.

4.4.1.2. Service availability and uptake

While OTT penetration in Trinidad and Tobago remains low, its use for messaging purposes seems considerable among those who do use such services. Amongst the 13% of total respondents to the TATT-CMR Survey who utilise OTT services, 77% revealed that they mainly used them for messaging functionality and 97% used these platforms to send messages at least once a day. This compares to 73% of all survey respondents who send more than seven SMS/MMS per week (i.e., at least one SMS per day, on average).

4.4.1.3. Relative prices

The potential price differential between OTT messaging and domestic mobile messaging services depends on the messaging scenario, with both services potentially offering messages at zero marginal costs[120]. OTT messaging services do not attract a per-message charge, but end users may face the mobile data-related costs of sending the OTT message. This will depend on whether that end user can use the data within their monthly allowance (in which case there is no extra cost); has to pay the out-of-bundle data charge; or is on a PAYG plan.

This also holds for domestic mobile messaging services, as many mobile bundles include unlimited SMSs, which results in the marginal cost for traditional (SMS) mobile messaging

[120] See footnote 106.

services faced by end users also being zero. For all other mobile users, a per-message charge will apply.

4.4.1.4. Switching evidence

According to the TATT-CMR Survey, 29% of all respondents would send fewer mobile messages and instead increase their usage of OTT messaging services in response to a 5% – 10% increase in mobile messaging prices[121]. This response is higher amongst respondents with higher levels of consumption, as can be seen in Table 12, which illustrates how willingness to substitute usage to OTTs varies depending on end users' current SMS/MMS consumption. In particular, the share of respondents willing to switch to using OTT voice in case of a price increase in mobile services drops to less than 25% for mobile users sending fewer than 50 SMSs each week (representing 71% of the total respondents).

Table 12: Intention to substitute (some) mobile for OTT messages following a 5% –10% price increase in mobile messaging services

Band of mobile messaging service consumption	**Share of total users in the consumption band**	**Share of users with willingness to switch within each band**
Fewer than 7 SMSs/MMSs per week	27%	21%
Between 7 and 50 SMSs/MMSs per week	45%	25%
Between 50 and 100 SMSs/MMSs per week	16%	38%
More than 100 SMSs/MMSs per week	13%	43%
Weighted average		29%

Note: Figures may not necessarily sum to 100%, due to rounding.

Source: TATT-CMR Survey

[121] It is pertinent to note that, according to data submitted by the concessionaires, SMS and MMS traffic volumes in Trinidad and Tobago have exhibited a downward trend in recent years. There is insufficient information available to conclude the reasons behind this observed trend with any certainty, although it is likely to be driven by a number of factors, over and above any increased uptake of OTT services. These might include, inter alia, a degree of substitution from SMS/MMS to voice calling; OTT messaging or voice services; lower overall levels of communication via telephony (for example, in lieu of email communication or increased face-to-face interaction); and changes in messaging habits (for example, sending fewer longer SMSs rather than many shorter SMSs).

As discussed when assessing similar evidence for domestic call services, although this evidence suggests that a share of end users of domestic mobile messaging services do consider OTT messaging services to be an option if domestic mobile messaging prices were to increase, in order for switching to these services to make 5% – 10% price increases unprofitable for a hypothetical monopolist (which is the requirement of the SSNIP test), and conclude that OTT messaging services are in the same market as domestic mobile messaging services, further data on volume of traffic affected and the cost of same, will be required[122]. However, low OTT penetration and quality differentials with mobile messaging services suggest that switching may be limited. Moreover, and more importantly, the majority (76%) of all survey respondents using OTT applications reported that availability of these services had not affected their usage of mobile services[123].

4.4.2. Supply-side considerations

Similar to the OTT voice services discussed above, there is no supply-side substitution between OTT messaging and mobile services in Trinidad and Tobago. This is due to the high barriers to entry to the mobile services market, in terms of the need to obtain a mobile service licence, gain access to mobile spectrum, deploy mobile network infrastructure and develop a retail distribution network. Given the time, investment and licence requirements, the Authority considers it unlikely that an OTT provider would enter the mobile service market following a SSNIP in mobile messaging services[124].

[122] See footnote 110.

[123] Source: TATT-CMR Survey results presentation, slide 65. Unsurprisingly, for the remaining 24% which did report a change in consumption of traditional mobile services, 94% revealed that this change included sending fewer traditional mobile messages (SMS/MMSs), i.e., the reduction in usage was also for messaging services rather than voice or data. The Authority notes that the survey results are not necessarily reflective of the wider trends, which show SMS usage declining. This could be for a number of reasons, including changes in customer preferences over time.

[124] See footnote 112.

4.4.3. Conclusions

Based on the assessment above, the Authority considers that OTT messaging services do not form part of the same product market as retail domestic mobile services. This is due to there being limited demand-side or supply-side substitution.

4.5. Key conclusions

Within this section, the Authority has determined whether the market for retail domestic mobile services, as defined in section 3, also includes other, non-mobile services. In particular, the Authority considered whether:

(i) retail fixed voice and/or broadband services should form part of the same product market as retail domestic mobile services.
(ii) OTT voice and messaging services should form part of that product market.

Having again considered demand-side and supply-side considerations in both cases, the Authority concludes that none of these services form part of the same product market as retail domestic mobile services. In particular, there is marginal supply-side substitutability, as retail domestic mobile services are provided under distinct licences, delivered via different network technologies and utilise different tariff structures or business plans. There is also no and/or limited demand-side substitutability between these services due to considerable differences in product features and end users' preferences.

5. Geographic scope of the Product Market

This section discusses the relevant geographic scope of the market for retail domestic mobile services. It follows the approach set out in sub-section 2.3.

5.1. Assessment of relevant geographic markets

As set out in sub-section 2.3, telecommunications markets are typically defined nationally, due to the geographic scope of service licences and concessions. Only if there is significant evidence to the contrary (i.e., due to differences in network coverage, service availability, pricing and/or competitive dynamics) will sub-national markets be defined. In general, the competitive dynamics on both the demand side and supply side need to be significantly different across Trinidad and Tobago (or within either island) to require separate geographic markets.

The Authority has not seen any evidence that the nature of the demand for retail domestic mobile services varies significantly at a sub-national level. This is despite the fact that demand is inherently local in nature.

In addition, the Authority is not aware of any observable differences in the characteristics of end users in different geographic areas, such as preference for specific technologies when accessing telecommunications services (e.g., preference for accessing domestic fixed services as opposed to domestic mobile services), which could affect the geographic scope of the demand for retail domestic mobile services.

Given both concessionaires' coverage and the national pricing of domestic mobile services, the relevant geographic scope of each product market is likely to be national. This is despite the fact that, nationwide, 4G coverage in Trinidad and Tobago is currently only available from Operator X, with Operator Y covering around 75% of the country. However, in support of a national market, both offer 3G services nationwide, which are typically sufficient to support mobile data usage, and Operator Y has publicly stated its intention to expand its 4G network. Therefore, it does not appear that, over the coming years, there will be any significant differences in geographic coverage from the main mobile concessionaires in Trinidad and Tobago. This is especially true as both mobile concessions are national in scope, and the

Authority continues to support national coverage. Indeed, there are currently no regulatory or legal barriers to providing retail domestic mobile services under the same terms and conditions across Trinidad and Tobago.

Similarly, the retail offerings from both Operator X and Operator Y do not differ within their relevant coverage areas and pricing is national (i.e., uniform prices are set within the country). This further supports the hypothesis that the relevant geographic markets are national. Furthermore, no submissions received from the concessionaires provided evidence to support sub-national markets.

Lastly, the above conclusion on defining a national market for retail domestic mobile services is in line with international precedent from, Bermuda, Europe and the GCC region, amongst other jurisdictions.

5.2. Conclusion on relevant geographic markets

Based on the assessment set out above, the Authority concludes that the geographic scope of the market for retail domestic mobile services, as defined in section 2 and sub-section 2.3, is national.

6. Conclusions

Having collected information from the relevant concessionaires, considered their representations and conducted analysis of the available information, the Authority concludes that there is a single relevant economic market for retail domestic mobile services, covering all customer segments (i.e., prepaid and post-paid plans for both residential and business customers). This market is national. The full scope of this market is set out in Table 13.

Table 13: List of services included in the retail domestic mobile service market

Product Scope	Customer Segments	Geographic Scope
Mobile access services	Prepaid/post-paid mobile tariff offerings	National
Domestic call services	Prepaid/post-paid mobile tariff offerings	
Domestic mobile messaging services	Business/residential tariff offerings	
Mobile data services	Business/residential tariff offerings	

Table 13 lists all the retail domestic mobile services, described by product scope, customer segments and geographic boundaries, which are included within the relevant market. To add further clarity to interpretation of the table, the relevant market is a single, national market covering all mobile products (i.e., mobile access services, domestic call and mobile messaging services, and mobile data services), across all the relevant customers segments (i.e., both prepaid and post-paid, and both residential and business).This conclusion has been reached in view of the findings described below, summarised from the Authority's market definition assessment conducted in sections 3 to 5 of this Determination. In particular, the Authority has determined that:

i. retail mobile access and domestic mobile calls/messaging should be considered in the same product market, as a result of end users purchasing these services, taking into account the characteristics of both access and call/messaging services, with the services

providing complementary functionality and end users facing a requirement to procure access and call/messaging from the same provider. Furthermore, concessionaires use the same infrastructure and sales channels to provide access and call/messaging services.

ii. mobile data services belong to the same market as mobile access, domestic call and messaging services, based on the supply-side substitutability of the services and similar functionality offered to end users on the demand side.

iii. prepaid mobile services are in the same market as post-paid mobile services. End-user functionality is fundamentally identical and, although there are differences in the services, the Authority notes that there is an overlap between the two types of products. Furthermore, prepaid and post-paid mobile services are supply-side substitutes, as the underlying infrastructure is identical.

iv. residential and business mobile services are in the same market. On the demand side, some end users may be able switch from business to residential service offerings. Moreover, the two products are supply-side substitutes, with similar inputs being used to deliver both business and residential services.

v. domestic fixed voice services do not form part of the same product market as domestic mobile services. There is no supply-side substitutability, since the services are provided under distinct licences and over different network technologies. Demand-side substitutability from mobile to fixed services is limited as a result of the importance end users place on the ability to use a mobile device to make and receive calls outside the home.

vi. retail fixed broadband services do not form part of the same product market as retail domestic mobile services. As for fixed voice services, fixed broadband and mobile data services are not supply-side substitutes, as these services require distinct licences and are delivered over different network technologies. Demand-side substitution is also limited due to significant differences in the preferences of end users and in product features.

vii. OTT voice services do not form part of the same product market as domestic mobile call services. There is no supply-side substitution as a result of the significant investments OTT players would have to make in order to begin offering traditional mobile services, and demand-side substitution is limited according to the evidence[125] considered by the Authority.

viii. OTT messaging services do not form part of the same product market as retail domestic mobile services, for the same reasons that OTT and traditional voice services are not in the same market due to there being limited demand-side or supply-side substitution.

ix. the relevant geographic market is national. Domestic markets may not be wider than national, and no evidence was provided to suggest that sub-national markets are appropriate. Both concessionaires provide nationwide coverage and set prices uniformly throughout Trinidad and Tobago.

Therefore, the above implies that Trinidad and Tobago mobile services consumers view mobile voice services (i.e. prepaid PAYG and prepaid plans and post-paid plans), to be substitutable with mobile data services. However, consumers of mobile voice services establish boundaries with (i.e. do not find substitutable) Fixed Voice, Fixed Broadband and OTT Voice and messaging services.

Consequently, based on all the data and or information assessed the Telecommunications Authority of Trinidad and Tobago (the Authority) has determined **the existence of a single relevant economic market for retail domestic mobile services.**

The Authority will endeavor to conduct periodic reviews of the retail domestic mobile market on a three-five year cyclical basis, or as it deems required, for accurate regulatory decision

[125] Evidence in this instance is defined as qualitative/quantitative submissions utilised in the market definition assessment. Notwithstanding the determination of the market boundary, the Authority reserves it right to conduct periodic and timely reviews of the market and all submarkets, as it deems necessary, for accurate regulatory decision making, in accordance with the Authority's regulatory functions and mandate.

making and the fulfillment of the Authority's function and regulatory mandate in keeping with the Telecommunications Act Chap. 47:31 and all its subsidiary legislation.