Telecommunications Authority of Trinidad and Tobago

PILOT HM SSNIP TEST OF THE TRINIDAD AND TOBAGO FIXED VOICE MARKET

Study Objectives

Over the period June to August 2014 the Authority sought to pilot the Hypothetical Monopoly Small but Significant Non-Transitory Increase in Price Tests on the domestic fixed voice market with the following aims:

1. To discern whether the existing product market of **fixed voice** suppliers in Trinidad and Tobago still constituted a **relevant market,** or whether:

    i. Mobile voice services should be considered to resided in the same market as traditional fixed voice services, and/or

    ii. Whether OTT VOIP services could be considered to reside in the same market as traditional fixed voice services

2. Secondarily, the study also sought to assess whether individual fixed voice service providers may be considered to hold **significant market power** and thereby, constitute a market on their own.

Methodology

- ❖ Primary Method –Time Series OLS Regression

- ❖ Secondary Method -Survey Methodology
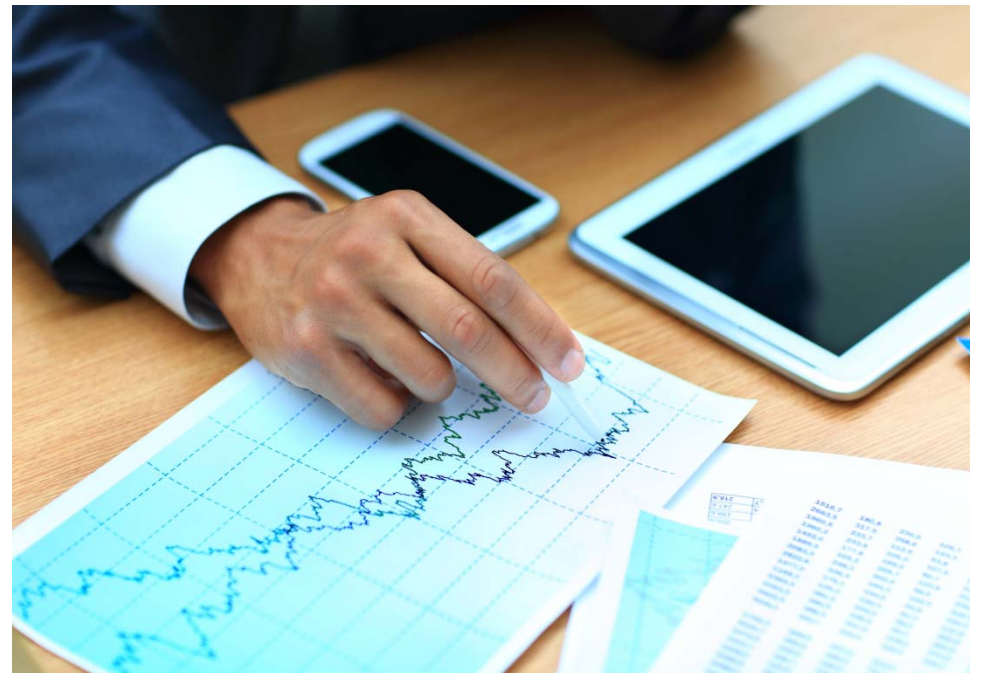
Regression Process

1. Specification of the demand function

    > Log linear InY = a +In X +In X2 +In X3

2. Explanatory variables significance testing

    > t and p values tests

3. Regression goodness of fit

    > R2 assessment

4. Elasticity coefficient determination

    > Regression results

5. Econometric modelling error testing

    > Cointegration, autocorrelation and multicollinearity tests

Survey Method

Customers were asked to complete an online questionnaire of their likely switching behaviour given a hypothetical "α" increase in the relevant price of their fixed voice service.

The questionnaire principally sought to identify:

1. The price most relevant to the consumer and

2. Their behavioural response to a 5% increase in the said price

Regression Specification

The demand function was specified as the change in quantity demanded for fixed talk minutes, in response to a change in the price per minute of fixed talk, the price per minute of mobile talk, and/ the price of accessing voice services using fixed internet platform.

$$logqdfm = logpf_1 + logpm_2 + logpvoip$$

Price of
fixed
voice
minutes

Quantity of fixed voice minutes

Regression Results

Source	SS	df	MS			
Model	.060972312	3	.020324104			
Residual	.018634115	20	.000931706			
Total	.079606427	23	.003461149			

Number of obs = 24
F(3, 20) = 21.81
Prob > F = 0.0000
R-squared = 0.7659
Adj R-squared = 0.7308
Root MSE = .03052

logfixedmin	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]	
logarmin	-.943784	.1998842	-4.72	0.000	-1.360735	-.5268328
logarminmobfix	-.6960016	.2890457	-2.41	0.026	-1.29894	-.0930627
logbbarsub	-.1588562	.3369995	-0.47	0.642	-.8618248	.5441125
_cons	18.57717	1.604972	11.57	0.000	15.22926	21.92508

Critical t value = 2.08 critical, critical p value = 0.05

Key Findings:

Price of existing fixed voice service, **very significant**

Price of mobile voice, **not significant**

Access price of OTT VOIP service, **not significant**

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Assessing the Profitability of a SSNIP

	Price	Demand per subscriber	Revenue earned (per sub daily)	Critical variable cost (per sub daily)	Average profit (sub/daily)	Average profit per month
Unit	TT$ / min	mins /day	TT$	TT$ /min	TT$	TTS
t1 (current)	0.59	12.26	7.23	2.29	4.94	42845,247.69
t2 (new)	0.62	11.68	7.24	2.18	5.05	43810,473.01
Δ t2-t1 (change)	0.03	(0.58)	0.00	(0.11)	0.11	965,225.32

For a 5% increase in the price per minute of fixed talk, the hypothetical monopoly, existing fixed voice product market in Trinidad and Tobago, would generate profit of TT$ .965 MM. Thus, the boundaries of the existing fixed voice market need not be expanded.

Key inputs

price E d	-0.944
% price Δ	0.05
% Qd Δ	-0.04505
#avg subscribers	288937

[t2 Calculated demand was calculated as the product of % price Δ and price Ed,
Critical cost based on existing contractual termination costs and origination estimates

Critical Tests

To assess the stability of the results the following critical test were performed. The test results indicated that the results and conclusions were stable under marginal variation

Critical elasticity (η^{crit})

     refers to the elasticity value that makes a SSNIP just unprofitable.

Critical sales loss (CSL)

     refers to the percentage of sales loss (or reduction in demand) that makes a SSNIP of 5% just unprofitable or marginal

Critical price increase ($\alpha^{crit.}$)

     refers to the highest value of α that makes the test just marginal or gives rise to zero impact upon profit

Critical mark-up (PCM^{crit})

     refers to the profit margin which makes the selected SSNIP just marginal in terms of its profit impact.

	η^{crit}	(CSL)	$\alpha^{crit.}$	PCM^{crit}
Critical	-1.432	0.62	37%	1.01
Actual	0.944	0.047	5%	0.68

Limitations

Notwithstanding the stability of the results observed, the influences of the following data gaps are noteworthy:

1. Data utilised consolidated business and residential consumers data.

   Given that the business segment accounts for significantly smaller share of revenue and minutes, its distortionary effects are expected to be small, but significance uncertain.

2. OTT price variable may not be effectively representative of the access price given accessibility from inter alia mobile platform & WIFI platforms etc.

   Re-specification is recommended and suggestions are welcomed!

3. The frequency of the time series(monthly) may influence inelastic results.

   Test were run on a quarterly frequency, with negligible change to results

4. The starting price used may not be reflective of the competitive price.

This is a typical weakness of the SSNIP and hence suggestions are also welcomed here!

Survey Method

The survey first captured which element(s) of fixed voice services consumers considered important when making their purchasing decisions.

Of the 87 respondents, 51.11% considered both the price of access and the price of making calls when choosing to purchase their fixed voice services, 27.78% considered the price of the fixed voice package. 8.88 % considered primarily the price of making a call and 12.22% considered primarily the price of access.

The implication of this means that regression results due to specification may represent only 8% of the market or alternatively could be run using both access and price of making a call. However, it may be noteworthy that the number of respondents represent ~ 0.0004 of the existing market.

Survey Method

Next, the survey asked consumers for their likely responses to a hypothetical price increase of five percent (5%) in the service previously identified. The responses are as follows:

	Sample Size	Continuing	Switching to other fixed	Switching to Mobile	Switching to OTT	Stopping
# Responses	87	68	4	5	5	5
% Responses	100%	78%	4%	6%	6%	6%

Survey Method Results

Change in profitability (given price increase α) = R {1+ (m+ α) E_d}

Where:

     R = revenue shares

     m= mark up or price cost margin

     α = price increase and

     E_d= own price elasticity of demand

$$\Pi \text{ Change} = -1.56$$

Survey results indicated that the market (as defined by the sample set) could not profitability increase price by 5% and therefore was not defined by existing traditional service providers.

Limitations

Some of the key limitations experienced in conducting the survey included:

1. Small participation of approximately *0.0004* of the existing market

2. Potential opt in bias due to survey method, may increase protestant responses

3. Exclusion of business customers, which traditionally tend to be less sensitive that consumers, in the short term.

4. Due to promotional offers, list price may not be reflective of the competitive price or the actual price paid by consumers.

Conclusions

Further to the limitations of both approaches, the two methodologies executed were anticipated *a priori* to diverge to some degree. Firstly, the survey method utilised what is known as "*stated preferences*" techniques, whereas the regression/ econometric analysis method used captures what is terms as "*observed preferences*" and thereby, some difference of values are inherent.

Additionally, the regression method captures behaviour over a historical two year period where as the survey method captures stated behaviour as at the time the survey was conducted, hence a persistent time period difference is also inherit in both methodologies.

However, diverging signals and conclusions are counterproductive and unacceptable for market regulation.

Next Steps

Given the limitations of the pilot study aforementioned and moreover given the importance of the study to effective market regulation, the Authority is considering undertaking an expanded survey and robust econometric study to formally determine the market boundary of the domestic fixed voice market. Your suggestions are welcomed.

Thank you