A Model for Seeking the Determinants of Sri Lanka Telecom (SLT) Monthly Household Expenditure

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Abstract

Communication expenditure covers a substantial slice in many household budgets in Sri Lanka. Regarding communication in Sri Lanka, Sri Lanka Telecom remains the oldest telecommunication infrastructure provider, and is considered the backbone of Sri Lanka's telecommunication industry. Today it is found that domestic telephone communication expenditures in Sri Lanka have become considerably high mainly due to the consumers' lack of knowledge about the conditions under which the telephone services are provided. Against this background, the main objective of this study is to identify the determinants of household telecommunication usage expenditure which significantly impacts the monthly budget of every household. While it employed both primary and secondary data, a sample of 250 SLT users in Matara district was selected under the simple random sampling method. Using descriptive statistics and the multiple linear regression model, an attempt was made to identify the determinants of SLT household usage expenditure. The descriptive statistics of the users indicated that 82 percent of the respondents are males whereas only 18 percent are females and that their monthly mean household telecom usage expenditure was found as LKR 2,082.00. According to the multiple linear regression model, the users' income has a significant positive relationship with their telecom household usage expenditure. The number of family members too has a significantly positive relationship while their age factor has a negative relationship. For the double and triple play users, the expenditure is higher than that for the single play users. Using the telephone at the peak hours is higher than that at the offpeak hours. By rasing consumer awareness in the users about the variation in the peak hour and offpeak hour telephone charges, a positive relationship can be established. Finally, it is concluded that the consumers are able to control their telecom expenditure themselves by identifying and managing the effects of various determinants, with the recommendation that awareness programs regarding SLT regulations and policies, telephone facility services, their taxes, their charges and costs should be conducted for the consumers, enabling them to overcome the issues of ignorance concerning telecom expenditure.

Key words: *Household expenditure, Sri Lanka telecom, Communication, Multiple regression model*

1. Introduction

According to Collin's dictionary (1979), telecommunication means "the telegraphic or telephonic communication of audio, video or digital information over a distance by means of radio waves, optical signals, etc. or along a transmission line." The telecommunication market represents a significant portion of Sri Lanka's economy. Communication expenditure plays an important role among many household expenses and Sri Lanka Telecom is the oldest and the backbone of the telecommunication infrastructure provider in Sri Lanka.

Telecommunication billing is a significant component of any commercial communication service provider. Telecommunication services are used by individuals for their day-to-day activities. It has played a significant role not only in the earlier ages but also in the present social relationships. Nevertheless, the devices like the telephone system were originally advertised with an emphasis on the practical dimensions of the device such as the ability of conducting business as well as ordering home services. Since the period of invention, the role that telecommunication has been playing in social relations has become increasingly important. This has caused to use these devices and services more than ever. In recent years, the opportunity of social networking has increased dramatically. It has increased the possibility of communicating with each other anywhere anytime. As Newton's third law "for every action, there is an equal and opposite reaction", the increasing facilities do increase the costs and bills of users. Every service provider prints their customers' usage bills individually and sends to the customer in order to inform their costs of usage for a certain time period. This time period is mostly a month and each and every detail of their usage is printed within the bill for the customers' clarification. This usually includes mainly the voice usage and the other service costs, a customer enjoys from the service provider.

Table 1 Average monthly household expenditure by major non–food expenditure groups - 2016 and 2012/13

Item	2016	2012/2013
	Value (Rs)	Value (Rs)
Total non-food	35,885	25,793
Housing	6873	4667
Fuel and Light	1757	1755
Clothing, Textiles and Footwear	1581	1194
Health and Personal care	2529	2181
Transport and Communication	5548	4315
Education	2066	1448
Cultural and entertainment	908	515
Non-durable household goods	362	318
Durable household goods	2261	1018
Other non-consumer expenditure	10945	7678
Liquor, Narcotic drug and tobacco	1056	705

Source: Household income and expenditure survey, 2016

Table 1 shows that compared to the year 2013, in 2016, a significant increase can be seen in expenditure. It can be clearly recognized from the table that after utilizing the income for housing facility, the highest expenditure was contributed to the transport and communication.

In every bill, it includes the telecommunication tax which is imposed by the government from the service provider and a part from this tax directly diverts to the customers' usage costs as a percentage. This percentage may vary according to the government regulations and protocols. Since the telecommunication usage is progressively increasing, the infrastructure facilities of telecom should be also improved day by day. For this reason, the government regularly imposes this telecommunication tax and levy. These taxes include the telecommunication levy, CESS, Value Added Tax (VAT), and Nation Building Tax (NBT), and the percentage of levy is dependent on each revenue stream of telecom and mobile

services. Presently, 25 percent of tax charged in telephone bills is for the broadband service and 42.73 percent of tax is for VAT and the other taxes. (Jithendra , 2016).

The specific research only focuses on the largest and oldest telecommunication service provider in Sri Lanka. Today, SLT leads the telecom industry with 77 percent of the country's fixed line network and it had acquired Mobitel by purchasing 60 percent of Mobitel shares in 2002 which is a SLT achievement. It is the only integrated operator in the country to offer a fixed line, data and mobile services according to Island Newspaper (2007). The telecommunication market represents a significant portion of Sri Lanka's economy. The revenue of telecom is mostly invented from the customer usage payments. SLT telephone connections are available as Fiber, Megaline, 4G/LTE and City link. Fiber and Megaline are the most reliable and superior quality wire line telephone connections which enable to connect the world by voice, broadband and PEO TV without any interruption. 4G/LTE is the hybrid product which had been introduced by SLT lately and it provides both voice and broadband together.

Telecommunication Network is a collection of transmitters, receivers, and communication channels that send messages to one another. Regarding the voice services, three voice services Megaline, FTTH and 4G are provided by SLT. "Broadband" is the brand name of SLT Asymmetric Digital Subscriber Line (ADSL) connection and this service can be used in all three voice services, Megaline, FTTH and 4G. By this service, SLT tries their best to provide their best speed through the line for the customer's maximum convenience. But this speed may depend on some factors which can be managed, but the main factor which affects the speed of the broadband connection is the distance between the telephone exchange and the customer's house. PEO TV service is another important service offered by SLT. The main purpose of PEO TV service is to provide a platform to entertain the customer not only through the local channels but also through the international channels by clicking a single button.

"Beware of little expenses. A small leak will sink a great ship." Franklin (1767) by this quote explains that a small leak can sink a big ship and can cause a great damage. Similarly, in life if you have a small expense that you continuously add onto, it will continue to grow from hundreds to thousands. Along with this quote, he may try to warn that if someone purposely manages their little expenses, they can suppress a great loss.

According to the Sri Lanka's penetration Clare (2017), the fixed line market in Sri Lanka remains underdeveloped due to the dominance of the mobile segment. Further, the number of fixed telephone lines is slowly declining as the mobile segment continues to expand. Overall penetration dropped from 16 percent in 2012 to 11 percent in 2017. According to Taylor (1995), telecom demand is distinct from demand for most goods and services because telecommunication services are not consumed in isolation; a network is involved. He also stated that for telecom services, a distinction is made between access cost such as handset cost and usage cost. They say that accessing telecom service provides utility to consumers in terms of the ability to make and receive calls. Telecom industry is one of the world's fastest growing industries regardless of what indicators are being measured. There are no related studies with model construction about the relationship between factors and the SLT telephone usage expenditure. Literature had to match with the closest researches that explain the relationships of different factors and other various expenses related to the mobile phone industry. These researches had tested and analyzed the significance of each factor of the expenditure. This research considers the significance of the factors such as income, usage time, the number of family members, level of awareness, etc. with the usage expenditure.

Brike & Swann (2010), Corrocher & Zirulia (2008) and Svigelj & Hrovatin (2008) have identified several factors related to the choice of mobile network. Rams & Schinder (2001) argued that the following four individual features are critical factors that affect customers' value of mobile telecom services:

- The network quality
- The price paid for obtaining access and using the network
- Customer care service facility
- The personal benefits they experience

SLT's performance in terms of network expansion and modernization, quality of service and customer relations, and internal operational efficiency has improved with privatization. These global trends are reflected in changes to Sri Lanka's telecommunication industry since the 1980s, driven by some major government initiatives to open up the sector to new entrants and greater competition. (Jayasuriya & Knight, 2000). Brand loyalty is an extremely important topic for researchers and marketers (Aaker, 1991).

According to Sekhampu (2012), household income, household size, age, employment, marital status and educational attainment of the head of the household significantly affect the total monthly expenditure on food. This has been analyzed

by using the multiple regression and data from a random sample of 585 households in Bopehlong. Gender and the age of the head of household were not important to explain the variations in household expenditure. Sekhampu & Niyimbanira (2013) had used 579 households for which they had administered questionnaires, face to face interviews, multiple regression and descriptive data as statistical tools. They had found that the socio-economic characteristics must be considered as important predictors of the expenditure patterns of township residents. Using UK micro data, Miles (1997) had shown that permanent income and the uncertainty of earnings have powerful effects on expenditure. According to Marina (2017), compared to the single consumers, married consumers' consumption is high.

Modern technology and improvement in communication sector have significantly contributed to social development in the past decade. The number of subscribers, technological innovations, government regulations and policies are the most influential contributing factors towards the growth of the telecom industry (Venkatram & Zhu, 2012). Based on the Porter's five forces model, the researcher had shortlisted the factors which influence the telecom industry and a key questionnaire was distributed to the randomly selected sample of 30 people to collect primary data and statistical reports were used as secondary data. To get the expected results, the researcher had used descriptive statistics. Granger causality test based on the time series was used in order to understand the correlation between the dependent and independent variables.

The observation of contributions of the government policies and regulations to the revenue generated by the telecom companies was not only interesting but also thought-provoking. The future telecom industry is filled with excitement and constant evolution, with all the new technologies and their applications that are coming into being. This is just the beginning. In the absence of developing their own value-added services, incumbent carriers will be over on the fast track as data become more prominent than the voice. There is a big migration underway from traditional voice to data. With this evolution, the payload itself becomes the value and the simple carriage of data becomes a marginalized commodity. However, the methodology was used to benchmark the performances of service providers in order to create a loyal customer base as well as to retain it, and they claim customer service is one of the factors that influences the revenue growth of the telecom industry (Kumar, Shankar & Debnath, 2014). As the demand for the value-added services of telecom industry increases, the evasion of the expenses is added to the existing expenditure. As there are no prior researches conducted regarding the customer's

payments on the usage of the service in Sri Lanka Telecom, this research tries to shed some light on the method of the customer bill payments in order to find out the actual reason behind these customers' disappointment. This research highly focused on the customer-dependent costs which can be varied and can be changed as the customer wishes. This is a great opportunity to reduce the usage cost yet even after offering such a reward, the usage amount still tends to be high. This study signifies several ways. Firstly, this signifies that utilizing facility services increases the usage expenditure. Secondly, the domestic income affects the usage expenditure to a certain extent. Thirdly, this research may increase the reliability towards the SLT and strengthen the customer base. The population of SLT is almost millions, therefore, it is hard to conduct the survey, using a fair representative sample and the research was done by using randomly selected 250 customers from Southern Province out of the SLT user population. Therefore, it might also lead to a deviation in analyzing results to a certain extent. This research has been done by taking the monthly average Sri Lanka Telecom household usage expenditure as the dependent variable and household characteristics as predictor variables.

2. Objective of the study

The objective of this study is to identify the determinants of Sri Lanka Telecom household expenditure. SLT is the older telecommunication service provider in Sri Lanka. Lately, customers have started to question and point out their bill amounts, comparing them with the charges and facilities of the other competitive telecommunication service providers.

3. Research Methodology

Both quantitative and qualitative data were used in this study. Primary data were collected by administering telephone interviews and pre-structured questionnaires to the customers who use Sri Lanka Telecom services and the secondary data were collected from the Sri Lanka Telecom data base and pre-published statistical reports according to the objective of the study. The sample was selected from SLT active customer base of the SLT Matara branch by using the simple random sampling method. The sample size was 250 and they were selected from the sampling frame of 36492 SLT customers (2017).

Sample size was decided by using the formula of,

$$n = (Z\alpha/2 * S(1-S)) / m2$$

Z = confidence interval (how confident the researcher wants to be that the actual mean falls within the confidence interval, 90 percent – 95 percent or 99 percent)

S = Standard deviation (how much variance the researcher expects in the responses which will be calculated using the pilot survey)

m = tolerated margin of error (no sample is perfect so the researcher should decide the extent of error to be allowed in the response which is usually +/- 5 percent)

Descriptive statistics (frequencies, cross tabulations) was used to identify the special characteristics of Sri Lanka Telecom household expenditure. Multiple linear regression model was used to identify the determinants of Sri Lanka Telecom household usage expenditure. The Multiple linear regression model was used in the analysis as follows.

Multiple regression model-

$$Y = \beta_0 + \beta_1 x_1 + \beta_1 x_1 + \beta_1 x_1 + \beta_1 x_1 + \ldots\ldots\ldots + \epsilon_i$$

Dependent variable = Yi = SLT household usage expenditure

Table 2 Explanatory variables used for the Regression model

Explanatory Variable (Xi)	Description of the variable	Dummy variable	Continuous variable
Age	Age of the household head (Years)		√
Gender	Gender of the household head	√ (Male=1) √ (Female=0)	
Marital status	Status of the household head	√ (Married=1) √ (Single=0)	
Education level	The highest education level within the household		√
Using Time	Peak and off peak	√(Daytime=1) √ (Night Time=0)	

	Monthly household income (LKR)		√
Family Income			
Living sector	Living area	√ (Urban=1) √ (Rural=0)	
No. of members	Number of members in the household		√
Excess Usage	Purchasing additional channels	√ (Purchased=1) √ (Not Purchased=0)	
Awareness	Awareness of the utilizing charges	√ (Aware=1) √ (Not Aware=0)	
Play	Utilizing facility services	√ (Single play= 1,double =2, triple=3)	

The Pearson's correlation coefficient was used to test the association between each pair of continuous predictor variables. Chi-square test was used to test the association between the categorical predictor variables and Analysis of Variance (ANOVA) was used to test the association between both continuous and categorical variables and the checked association among all explanatory variables to overcome the problem of multicollinearity major assumption of multiple regressions. Then by comparing the R^2 values with ANOVA table values, significant variables of the best fitted model were selected as the determinants that do affect SLT household usage expenditure.

4. Analysis and Results

Considering the demographic profile of the sample, it indicates that 82 percent of the respondents who pay telephone expenditure are males and only 18 percent are females. Mean monthly household usage telephone expenditure was found as 2082 rupees.

Considering less than mean as low and higher than or equal mean as high, it reveals that 75 percent of male respondents and 45 percent of female respondents are bearing

a high telephone expenditure, showing a higher proportion for males than females. This also indicates that the households where the males are higher in number tend to bear a higher expenditure on telecommunication. Usually male's exposure to the outside world is higher than that of the females which is clearly confirmed through plotting the telephone expenditure by the usage time.

By analyzing descriptive statistics, it can be concluded that most of the respondents utilized the SLT facilities on the peak hours (day time) and it is 86.4 percent from the total sample, 68 percent of the respondents using peak hours are males and it is 58 percent for normal hours. This implies that the usage expenditure of the majority of male respondents can increase due to the peak hour utilizing.

Additionally, the income has a positive relationship with the high telephone usage expenditure and a negative relationship with low telephone usage expenditure. For the higher income groups, the percentage of the respondents with high telephone usage expenditure is higher and for the lower income groups, the percentage of the respondents with low telephone usage expenditure is higher.

Survey data recorded that minimum age and maximum age of respondents are 25 years and 87 years respectively. It revealed the lowest age group (25-39) pays the highest telephone bill and it is recorded as 73 percent while it is 38 percent for the age group above 70 years.

Insignificant explanatory variables such as the level of education, living sector, excess usage, marital status and gender, which are identified as not related to the telephone expenditure, were removed from the model.

Multiple-linear regression model was derived to identify the determinants of telecom usage expenditure and the summary of the results with significant explanatory variables is given in Table 3.

Table 3: Multiple linear Regression Model: Determinants of Sri Lanka Telecom household usage expenditure

Explanatory Variables	Coefficients	S.E.	t	Sig.
Income	1.203	0.59	2.03	0.030
Number of members	1.846	0.82	2.25	0.026
Age	-0.851	0.32	-2.65	0.020
Using time	325.926	5.78	4.48	0.010
Awareness	38.120	7.12	5.35	0.003
Facility service Double play	651.35	3.65	178.45	0.000
Triple play	1372.25	6.99	196.31	0.000
Constant	207.523	11.08	18.72	0.001
R Square	0.69			

Source: Survey data analysis

Income has a significant positive relationship with telecom usage expenditure, showing the nature of income and expenditure pattern as key economic factors. If all independent variables are fixed at zero value, the average value of telephone expenditure is estimated at about 207.523 rupees. If income is increased by a rupee, expenditure on telecommunication is also increased by 1.2 rupees. The number of family members too has a significant positive relationship while the age has a significant negative relationship with telecom expenditure. Considering the facility service, the study found a positive relationship with SLT household usage expenditure. For the double play and triple play users, expenditure is higher than single play users. Being a double play user causes to increase the average expenditure by 651.35 rupees relative to single play users while it is 1372.25 for triple play users. Further, the study revealed that for a double play user, monthly average telecom household usage expenditure is 858.873 rupees while for a triple play user, it is 1579.773 rupees. The time of use was found as an important determinant of telecom expenditure as expenditure is higher at peak time than off peak time by 326 rupees. The study found that the awareness has a significant positive relationship with the expenditure and it decreases the expenditure. Having a better knowledge of the bill structure is leading to reduce the telephone expenditure. The constructed model achieved the coefficient of determination (R^2) as 0.69 while describing 68 percent of total variability of expenditure by the selected significant variables given in Table

2. According to F value given in the ANOVA, the established regression model was found to be significant as p value is less than 0.05.

5. Conclusion and recommendations

The main objective of this study was to identify the determinants of Sri Lanka Telecom household usage expenditure with special reference to Matara District by using 250 respondents who use Sri Lanka Telecom services, with the use of simple random sampling techniques. Descriptive statistics and multiple linear regression model were used to identify these determinants. Age, gender, marital status, education, using peak or off-peak time, family income, living sector, members of the family, excess usage, and awareness were studied comprehensively through this study. Among them, marital status, education, living sector, gender and excess usage were ignored for violating assumptions. The study concluded the positive relationships of income, family members, using peak time, facility service and awareness of telecom household usage expenditure. The demographic variable, age has established a negative relationship with telecom household usage expenditure.

According to the above findings, the following recommendations were identified as the final contributions of the study. In terms of the level of awareness, it is significant to be aware of the SLT regulations and policies about the costs before consumption. The charging plans and taxes should be highly concerned to avoid the burden of a high telephone expenditure. Awareness programs should be held to address the importance of awareness to reduce the telephone expenditure. Having facility services and using the peak time highly affect the increase of the telephone expenditure. It conveys that purchasing additional facility services may be a heavy burden to the customers who bear the SLT expense. The lack of knowledge regarding these aspects is a key factor of obtaining a huge telephone bill. However, various programs should be organized regarding additional facility services, taxes and cost, and SLT regulations and policies. Finally, it can be concluded that the consumers can control their usage expenditure on their own by identifying and managing the effects of various determinants rather than complaining about the SLT Company.

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