DETERMINANTS OF THE DEMAND FOR CABLE TV SERVICES IN THE ERA OF INFORMATION COMMUNICATION TECHNOLOGY

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Abstract

The research investigates the determinants of the demand for cable TV services in the era of Information Communication Technology in reference to dialog cable TV pearl package. Data for the study were collected from January, 2015 to March, 2018. Very recent data were gathered to enhance the relativeness of the results for the current era of the information technology. The process includes identifying the significant independent variables that determine demand of the selected product, analyzed data using multiple linear regression and Log-linear regression forward selection method to identified significant variables which best fit for the demand of Pearl TV package. Based on the analysis performed, it is noted that Log-linear regression model is the most appropriate model to explain the relationship between the dependent and the independent variables of the Pearl TV package. R square of the study shows 88.93% variation of the dependent variables is explained by the model. The F ratio indicates that the model as a whole is significant at the 5% significance level. And price of complementary product (X7), annual household income (X6) and Tax component (X3) variables are explain the dependent variable for the demand of cable TV in reference to dialog PLC pearl package.

Keywords: Demand, Cable TV. ICT

Introduction

The rapid growth in the telecommunication sector has vast impact on consumers in Sri Lanka. Particularly, cable TV became as one of the media channels most affected by the development and expansion of these new technologies. The enhancement of technologies and succession in communication are causative for companies to import raw materials and also export their product though the pace of improvement can be say as a streak of lightning and therefore telecommunication tools no longer can be mistreated by anyone in this new era (Craig, Samuel and Douglas, 1996). The most recent estimates specify that average individuals devote more time daily to watching TV than to any other leisure activity. Moreover, consumers also get to choose how to view the content given the increasing variety and portability of video players (e.g. smartphones, tablets, laptops). These changes have not only ensured the growing success of online streaming services, but also contributed to the loss of competitive advantage of television programming services (Reis, 2015).

Most of the existing research on the topic focuses on the relationship between TV viewing and Internet penetration. In this paper, we empirically investigate the determinants affecting the demand of cable TV.The issue of industries are moving to globalization has alerted the world since 1990's and until recently, it is still a booming area of research among educators and society. The significance level of globalization is swelling throughout the world in the 21st century (Rato, 2006). Therefor television plays a huge role in the communication and media industry; it is more prominent to look at the empirical economic evidence regarding the possible interferences of the cable TV. The purpose of this study is to investigate the current determinants of the demand for dialog cable TV services, specifically focusing on the demand of Dialog Pearl TV Package.

Literature review

In general, to explain the demand for media services, researchers rely on standard microeconomic demand theory, in which the quantity demanded is a function of price, household income, various measures of "quality" of the service, availability of substitutes, and variables representing consumer tastes [Hothi and Bodkin (1980); Park (1972)]. Consumer has different tastes, needs, motivation and lifestyle when they want to purchase a product (Chisnall, 1985).

Intention to purchase depends on the degree to which consumers expect the product to satisfy them when they consume it (Kupiec and Revell , 2001). Some of them preferred high quality and willing to pay high price, some of them are not (Monroe, 2003). Therefore, the consumer will choose a product or brand to consume from various choices in the market. Different situation will be affected by different factors (Bettman, Johnson and Payne, 2000).

Furthermore, the consumer behavior towards purchasing a product can be investigating through the consumer characteristics. It include brand conscious, price conscious, quality conscious, recreation conscious, innovation conscious, confused by over choice, impulsive and brand (Leo, Bennett, and Hartel, 2005). Satisfaction level of consumers' needs and wants through the owning of the product, usage, and utilization for a product (Kotler, Philip, Armstrong, and Gary, 2007). Demand can be defined as "the willingness and the ability to pay a price for a specified product and service" (Sexton, 2007). Therefore, it is important to study the factors that affect t consumer's decision towards buying a Smartphone. The variables under investigation in this study include product features, brand name, price and social influences.

In this new era, stated that the phones now feature with wireless connectivity, a built-in Web browser, application installation, full programmability, a file management system, multimedia Presentation and capture, high-resolution displays, several gigabytes of storage and location and movement sensors (Oulasvirta et al., 2011)

Methodology

Sample and Data

To select the sample for cable TV, the following restrictions were imposed; Dialog PLC has selected as one of best telecommunication company in Sri Lanka. Dialog Axiata PLC is a subsidiary of Axiata Group Berhard operates mobile telecommunications network in Sri Lanka. The Company differentiates its postpaid package through offering several cable TV packages such as Pearl package, Power Plus package, Thee package, Diamond package, Emerald package and Gold package. Among the range of packages offered by the Company, Pearl package have been selected for the analysis, which is one of the highest revenue generating TV package of the Company. As to be more prominent on current environment for the package monthly data of the period of January, 2016 to March, 2018 were collected..

Hence, through this study it is expected to carry out a comprehensive analysis, to identify the factors which affecting the demand of "Dialog TV – Pearl Package"

Research Hypotheses

The hypotheses for this study are stated as follows:

H1: There is a significant relationship between demand and price of cable TV pearl package

H2: There is a significant relationship between demand and price of substitute product

H3: There is a significant relationship between demand and tax component

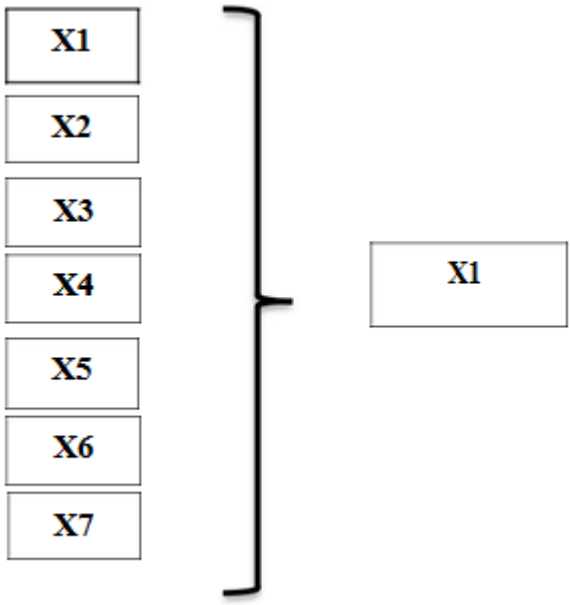
H4: There is a significant relationship between demand and household growth rate

H5: There is a significant relationship between demand and advertising and promotions

H6: There is a significant relationship between demand and annual household income

H7: There is a significant relationship between demand and prices of complementary product
Literature

Conceptual Framework



Model of the Study

The Model for this study multiple regression analysis is used in estimating the demand function for Pearl TV package, the empirical model is specified as follows:

The full specification of the linear regression equation using unranked OLS is:

$Q = \beta 0 + \beta 1\ X1 + \beta 2X2 + \beta 3X3 + \beta 4X4 + \beta 5X5 + \beta 6X6 + \beta 7X7 + \varepsilon$

Log-linear Demand Specification

$\ln Q = \beta 0 + \beta 1 \ln X1 + \beta 2 \ln X2 + \beta 3 \ln X3 + \beta 4 \ln X4 + \beta 5 \ln X5 + \beta 6 \ln X6 + \beta 7 \ln X7$

Where:

Q = Quantity Demanded

X1= Price of Pearl Package

X2 = Prices of substitute products

X3 = Tax component on Own Price

X4 = Household growth rate

X5 = Advertising and promotions

X6 = Annual household income

X7 = Prices of complementary product

β0= constant

β1= coefficient of Price of Pearl Package

β2= coefficient of Prices of substitute products

β3= coefficient of Tax component on Own Price

β4= coefficient of Household growth rate

β5= coefficient of Advertising and promotions

β6= coefficient of Annual household income

β7= coefficient of complementary product

ε = stochastic error term

Data description

Price of Pearl Package (X1) - Price of the selected package contains two components as initial connection fee and monthly rental.

Prices of substitute products (X2) - For the analysis, we selected the price of "Silver Plus" package as the price of substitute. Because, "Pearl" package of Dialog TV offers 73 default channels and "Silver Plus" package offers 74 default channels

Tax component on Own Price(X3) – Regards on government tax regulations.

Household growth rate (X4) -Consideration is given to the increase in households with electricity, instead of the increase in population. This is because, for a pay TV product, the demand arises from the households with electricity and not from individuals on the demand.

Advertising and promotions (X5) - The Company spends on advertising and promotions with the aim of attracting new customers and to keep existing customers informed of about new products and new features

Annual household income (X6) - Satellite TV connections are purchased for a household and thereby household income has impact on the demand

Prices of complementary product (X7) - Television are a complementary product for the satellite services as consumers are unable to view the satellite channel services without having a television.

Data presentation and analysis

Prior to perform the estimation for Pearl TV package, it is important to identify the type of relationship exists between the dependent variable and the independent variables i.e. whether there is a linear relationship or a non-linear relationship among the variables. To determine the most suited relationship between the variables we performed multiple linear and log linear regression analysis. In both cases used forward selection model to identify the most significant variable for the demand of Dialog cable TV Pearl Package.

Multiple Linear Regression Analysis-Forward Selection Model

Here we started with 1 variable at a time is fitted to the model to identify the most significant variable at 5% level of significance.

Model 01-07 Explanation						
Variable	T value	P value	R square	F value	Sig F	Significance/Insignificance
X1	-0.339854378	0.735887981	0.003111934	0.115500998	0.735887981	Insignificant
X2	**9.263394602**	**3.53954E-11**	**0.698722779**	**85.81047955**	**3.53954E-11**	**Highly Significant**
X3	-8.008913146	1.34285E-09	0.634180186	64.14268977	1.34285E-09	Significant
X4	-3.881663633	0.000412405	0.289381415	15.06731256	0.000412405	Significant
X5	-1.284198748	0.207055637	0.042670168	1.649166425	0.207055637	Insignificant
X6	-2.106552349	0.04199831	0.107090343	4.437562798	0.04199831	marginally significant
X7	9.159379605	4.74989E-11	0.693947358	83.89423476	4.74989E-11	Significant

Table-01

As per above variable all 5 variables are significant except X1 and X5.Highest significant variable is X2(Substitute price) with highest T and F values and Highest R2 with lowest P value. Therefore by keeping X2 in the model we fit the other variables.

Model 08-13 Explanation						
Variable	T value	P value	R square	F value	Sig F	Significance/Insignificance
X1	-1.351696237	0.18490505	0.713274744	44.77786714	1.71549E-10	insignificant
X2	9.442722759	2.80973E-11				significant
X2	3.492838117	0.001284385	0.726773118	47.87931574	7.20148E-11	significant
X3	-1.922465695	0.062487641				insignificant
X2	7.061052252	2.73044E-08	0.702041367	42.41107048	3.42616E-10	significant
X4	-0.633213136	0.530596811				insignificant
X2	8.881224766	1.33859E-10	0.699991052	41.99821039	3.87629E-10	significant
X5	0.390113049	0.698751684				insignificant
X2	**10.05016856**	**5.43402E-12**	**0.765376889**	**58.71878498**	**4.64167E-12**	**Highly significant**
X6	**-3.198006362**	**0.002882687**				**Highly significant**
X2	1.145242921	0.259665248	0.704705758	42.95614966	2.91467E-10	insignificant
X7	0.85404845	0.398725706				insignificant

Table-02

Select X6 as the 2nd independent variable in model with Higher T value, F value and R^2 with Lowest P value. Therefore by keeping X2, X6 in the model we fit the other variables.

Model 13-18 Explanation						
Variable	**T value**	**P value**	**R square**	**F value**	**Sig F**	**Significance/Insignificance**
X2	9.857126723	1.2338E-11	0.765543011	38.09370385	4.02485E-11	significant
X6	-2.793325054	0.008402475				significant
X1	-0.157476333	0.875774453				insignificant
X2	4.149292527	0.000202265	0.780030606	41.37101476	1.32977E-11	significant
X6	-2.911006854	0.006229016				significant
X3	-1.526956921	0.135759115				insignificant
X2	8.01984727	1.94168E-09	0.765378925	38.05890329	4.07403E-11	significant
X6	-3.073839391	0.004079351				significant
X4	-0.017428434	0.986193801				insignificant
X2	9.659014284	2.08499E-11	0.766842683	38.37107966	3.65465E-11	significant
X6	-3.167856524	0.003180408				significant
X5	0.469079016	0.641922084				insignificant
X2	2.016155133	0.051509871	0.76538868	38.06097072	4.07109E-11	insignificant
X6	-3.008796261	0.004836752				significant
X7	0.041939795	0.966785039				insignificant

Table-03

As per the above table either one of the variables are not significant. Therefore we cannot add any of them to the model and stop adding more variable to the model

Model 12								
SUMMARY OUTPUT								
Regression Statistics								
Multiple R	0.87486							
R Square	0.76538							
Adjusted R Squar	0.75234							
Standard Error	1491.13							
Observations	39							
ANOVA								
	df	*SS*	*MS*	*F*	*Significance F*			
Regression	2	261119791	130559895.3	58.71878498	4.64167E-12			
Residual	36	80045189	2223477.467					
Total	38	341164979						
	Coefficient	*andard Er*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	-8254.04	11577.701	-0.712925822	0.480487606	-31734.70847	15226.6242	-31734.70847	15226.6242
X2	5.41041	0.5383406	10.05016856	5.43402E-12	4.318608805	6.502219677	4.318608805	6.502219677
X6	-0.17308	0.0541226	-3.198006362	0.002882687	-0.282850037	-0.063318676	-0.282850037	-0.063318676

Source: Microsoft Excel 2010 output

Table 4

Therefore according to linear regression analysis forward selection method shows above results. According to that it has 76.5% R2 value and 75.2% Adjusted R2 which implies higher significant with the selected dependent variable with independent variables. The final model will be according to linear regression analysis forward selection method is,

Q=-8254.04+5.41041X2-0.173X6

Log-linear Demand Specification

$\ln Q = \beta 0 + \beta 1 \ln X1 + \beta 2 \ln X2 + \beta 3 \ln X3 + \beta 4 \ln X4 + \beta 5 \ln X5 + \beta 6 \ln X6 + \beta 7 \ln X7$

Forward Selection method has been used for log linear regression in order to select the best model which interpret the independent variable the most.

Variable	T value	P value	R square	F value	Sig F	Significance/Insignificance
X1	0.142991832	0.887072523	0.000552307	0.020446664	0.887072523	Insignificant
X2	13.71026561	4.45793E-16	0.835534638	187.971383	4.45793E-16	Significant
X3	-10.89754408	4.18671E-13	0.762449671	118.7564671	4.18671E-13	Significant
X4	-2.921968458	0.005899026	0.187489975	8.537899672	0.005899026	Insignificant
X5	-1.980045464	0.055172262	0.095809493	3.92058004	0.055172262	Insignificant
X6	-1.669779929	0.103403334	0.070075235	2.788165011	0.103403334	Insignificant
X7	**14.89033003**	**3.31814E-17**	**0.856989316**	**221.7219285**	**3.31814E-17**	**Highly Significant**

Table-05

First when the independent variables were run individually with the dependent variable the X7 becomes highly significant with higher t value and with a lower P value. Next other independent variables were run with the fixed X7 variable and the dependent variable. X6 variable was chosen as the next variable which has the lowest P value compared to 5% significance level as mentioned below.

Variable	T value	P value	R square	F value	Sig F	Significance/Insignificance
X7	15.07532404	3.9561E-17	0.863331385	113.7054393	2.76719E-16	significant
X1	-1.292505298	0.204416908				insignificant
X7	2.473262299	0.018242564	0.85942139	110.0422389	4.59776E-16	significant
X2	0.789187149	0.435169641				insignificant
X7	5.647802864	2.05484E-06	0.874048536	124.9121935	6.36294E-17	significant
X3	-2.208153332	0.033688863				significant
X7	12.98451203	3.78117E-15	0.857034649	107.9046328	6.22521E-16	significant
X4	-0.106842603	0.915507046				insignificant
X7	13.87051371	5.16564E-16	0.857477585	108.2959237	5.88704E-16	significant
X5	-0.351187855	0.72749448				insignificant
X7	**15.26007961**	**2.70346E-17**	**0.875488943**	**126.5654744**	**5.173E-17**	**significant**
X6	**-2.312750484**	**0.026564155**				**significant**

Table 6

Afterward, other independent variables were run with the dependent variable and the fixed X7 and X6 and the summarized results are as below.

Variable	T value	P value	R square	F value	Sig F	Significance/Insignificance
X7	14.90507986	9.98461E-17	0.876108613	82.5018379	6.08494E-16	significant
X6	-1.899904563	0.065709832				insignificant
X1	-0.418401803	0.678209646				insignificant
X7	1.820592703	0.077228047	0.883103901	88.13706293	2.20881E-16	significant
X6	-2.662857268	0.011628223				significant
X2	1.509968059	0.14002761				insignificant
X7	**5.978723078**	**8.23558E-07**	**0.889382939**	**93.80229556**	**8.43318E-17**	**significant**
X6	**-2.202705291**	**0.034292902**				**significant**
X3	**-2.096701182**	**0.043315207**				**significant**
X7	13.5290779	1.81774E-15	0.875584612	82.1052277	6.54955E-16	significant
X6	-2.284380733	0.02852599				significant
X4	0.164051824	0.870634071				insignificant
X7	14.31915243	3.35221E-16	0.875573737	82.09703261	6.55953E-16	significant
X6	-2.25616632	0.03041154				significant
X5	-0.154440493	0.878149578				insignificant

Table 7

X3 independent variable has become significant with both X7 and X6. Therefore, X3 has added to the model and other variables have been run again individually in order to figure out whether any other variable becomes significant.

Variable	T value	P value	R square	F value	Sig F	Significance/Insignificance
X7	5.374807468	5.59903E-06	0.889605423	68.49653565	8.66095E-16	significant
X6	-2.087649297	0.044394706				significant
X3	-2.03883066	0.0493027				significant
X1	0.261767137	0.795080336				insignificant
X7	0.904082846	0.37231306	0.897952838	74.79482042	2.29549E-16	significant
X6	-2.613807423	0.013244867				significant
X3	-2.224265797	0.032875245				significant
X2	1.689767158	0.100223277				insignificant
X7	5.934385501	1.0478E-06	0.8902036	68.9160173	7.90179E-16	significant
X6	-2.220418358	0.033159106				significant
X3	-2.127669022	0.040697792				significant
X4	0.504112431	0.617433638				insignificant
X7	5.688388655	2.18797E-06	0.889732362	68.58517323	8.49433E-16	significant
X6	-2.12926929	0.040555801				significant
X3	-2.089420977	0.044224981				significant
X5	-0.328239771	0.744743364				insignificant

Table 8

According to the summary of the regression outputs no other variable seems to be significant to the model. Hence, the final model derived from the log linear regression can be presented as

Final Model

$lnQ=-4.28696+4.7629lnX7-3.51294lnX6-0.69241lnX3$

The derived model explains the dependent variable by 88.94% and the adjusted R square 88.99% and the regression output of the above model is as below. Further, the model derived through linear regression explains 76.53% of the total variance and Adjusted R square 75.23% and the log linear model is deemed to be the best model which explains the dependent variable by 89% approximately.

Model 16

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.943071
R Square	0.889383
Adjusted R Square	0.879901
Standard Error	0.229677
Observations	39

ANOVA

	df	*SS*	*MS*	*F*	*gnificance F*
Regression	3	14.84466985	4.948223	93.80229556	8.43E-17
Residual	35	1.846306787	0.052752		
Total	38	16.69097664			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	4.28696	21.95402031	0.19527	0.846310834	-40.2821	48.85599062	-40.28207075	48.85599062
X7	4.762969	0.796653147	5.978723	8.23558E-07	3.145677	6.380260423	3.145676684	6.380260423
X6	-3.51294	1.594828418	-2.20271	0.034292902	-6.75061	-0.27526318	-6.750610812	-0.27526318
X3	-0.69241	0.330237468	-2.0967	0.043315207	-1.36283	-0.02199159	-1.362826989	-0.021991587

Table 9

Model Comparison

Model	R Square	Adjusted R Square	F statistic	Identified Variables
Multiple linear Regressions	**76.538%**	**75.234%**	**58.718**	**X2,X6**
Log Linear Model	**88.938%**	**87.990%**	**93.802%**	**X3,X6,X7**

Table 10

Higher the value of R square and Adjusted R Square better the model explained the variation between dependent and independent variables. Based on that, it can be concluded that the relationship between the dependent and the independent variables of Dialog Cable TV Pearl package is properly explained by the Log-linear regression model.

According to the above results, 88.938% of the dependent variable in the model which is the quantity demand of Pearl TV package is explained by the selected independent variables: X3,X6 and X7. And 11.062% only determine the dependent variable by other variables.

The standard error of the model it is accounted for approximately about 22.96%. Standard error will explain that the accuracy of the predictions of the model. The Standard error represents the average distance that the observed values fall from the regression line. In simple terms this will implies that how wrong the regression model is on average using the units of the response variable. Therefore it can be conclude that relatively this regression model is good model for the regression analysis based on the standard error since the figure is relatively lower.

Log linear Model is,

lnQ=-4.28696+4.7629lnX7-3.51294lnX6-0.69241lnX3

Conclusion

The study is undertaken to examine the determinants for the demand of cable TV in the era of ICT and how the Information technology has impact on consumer behavior of using cable TV taking the sample of dialog cable TV pearl package. Based on the results obtain through the demand estimation, Price of pearl package, Price of substitute product, household growth rate, advertising and promotions do not have significant relationship with the quantity demand of the dialog cable TV pearl Package. The regression results indicate that Tax component (X3) of Pearl TV package is negatively related with its demand therefore, the management must consider other alternatives when attempting to increase the revenue other than the increase of price. .

The annual household income (X6) indicates that the consumer perceived Pearl TV package as an inferior product. This implies that if the consumers have more purchasing power, the product will have lesser demand as consumers will shift to other substitute products. The management must take necessary actions to remove this perception of the consumers by introducing more value adding services to the product, otherwise in long term the demand for Pearl TV package will gradually decline. The Prices of complementary product (X7) have positive relationship with the demand quantity of dialog cable TV pearl package.

Future researcher can be expand this research examine more cable TV packages or using different telecommunication products which have more demand relating to Information technology impact on current economy.

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