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RELATION BETWEEN FAMILY SIZES AND LPG CONSUMPTION

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Abstract
Over the last five decades, Liquefied Petroleum Gas (LPG) marketing guidelines are in existence in India. Presently, there are 14 corer customers on Industry basis. LPG marketing activities are expected to grow further because of the focus on expansion in rural areas. To meet challenges of growing customer the guidelines for distribution of LPG need to be constantly updated. The nature of present study is to explore the effect of different factors affecting the policy and to provide guidelines for subsidy given for household purpose. Further, it can also be helpful to prevent malpractices in the sale of LPG given on subsidy to the household. This study is based on pilot survey conducted on household consumer consumption.

Introduction

The subsidy on LPG is given by Ministry of Petroleum & Natural Gas, for cooking purpose to all the households all over the country. The Government has sanctioned 12 cylinders under subsidy for a family per year irrespective of the size of the family. However, this decision is not an appropriate one for all families as some of them are small and some are large. Basically, consumption of LPG is for a household; mainly depend upon the size of family. Consequently, this causes injustice to some families which are larger in size. On the other hand small size families are benefitted. Consequently, such benefitted families may be the cause of malpractices developed in this regard. Briefly, this may cause problems like black marketing of LPG and misuse of LPG for other purposes other than cooking.

Purpose of present study is to understand the nature of the problems related to this topic and to give suggestions in the limitation of the survey. I emphasize here the relation between family size and consumption of LPG on the basis of pilot survey.

Methodology

Data is collected by conducting a pilot survey to study the relation between family size and LPG consumption. A sample of 49 families was taken to study the problem. While taking sample, some families were from Kolhapur city and some are from villages in Kolhapur district. From each sampled family size, basically, data was collected for the average number of days required to consume LPG cylinder. The weight of subsidized cylinder for household is standard that is 14.2 kg.

To illustrate the fact of injustice in providing 12 cylinders to large size families and benefitting to those having less family size a normal data from 49 families was collected and analyzed.

Data based on family size and average number of days required to consume a cylinder is considered. It is verified that the data fits well to a linear trend. For this purpose, the independent variable is size of family (taken as x) and the dependent variable is number of days required to consume cylinder (taken as y). The descriptive statistics is:

n=Number of families investigated=49

$\bar{X}$=Average family size=4.4897

$\bar{Y}$=Average number of days a family requires to consume a cylinder of LPG=36.4081

V(X)=1.5560 ; V(Y)=43.6701 ; Cov(X,Y)= -5.1591

Correlation coefficient between X &Y=r= -0.62586

The fitted regression line Y(number of days) on X(family size) is :-

$$\hat{y}=\hat{a}+\hat{b}x$$

$$\hat{y}=51.2943-(3.31557)\,x$$

Where, $\hat{a}=51.2943$; $\hat{b}= -3.31557$

To test b=0

The hypothesis to be tested is:-

H_0: b=0

H_1: b≠0

We have ,

$\Sigma(Y-\hat{y})^2=1301.672$; $\Sigma(X-\bar{x})^2=76.2449$

We know that,

$$t=b/S.E.$$

Here,

$$S^2= (1/n-2)^* \Sigma(Y-\hat{y})^2$$

$$= (1/49-2)^*(1301.672)$$

$$=27.69515$$

Therefore,

$$S=5.2626$$

Now,

$$S.E. = S/\Sigma(X-\bar{x})^2$$

$$=5.2626/76.2449$$

$$=0.069022$$

$$t = -3.8139/0.069022$$

$$= -48.0362$$

And $t_{0.025,\,(n-2)} = t_{0.025,\,(47)} = 2.01365$

Here, $|t| > t_{0.025, (n-2)}$ i.e. 48.0362 > 2.01365

Hence, reject Ho.

Therefore, I conclude that consumption in terms of number of days depends upon family size which fits linear trend.

Based on this fitting of line, estimated number of days required for consuming a cylinder and annual requirement of number of cylinders corresponding to the size of family is given in the following Table No. 1.

Table No. 1

Family Size	2	3	4	5	6	7
Estimated days required to consume a LPG cylinder	59.0158	52.2442	45.4726	38.7010	31.9294	25.1575
Total number of cylinders required annually	6	7	8	9	11	15

Average-10.74

Conclusion

1] The correlation coefficient between family size and number of days of consumption of LPG cylinder is negative. That is increase in family size decreases the use of number of days required to consume a cylinder. Hence, government should take an account of family size while giving subsidy on LPG.

2] In this, work the number of days required to consume LPG cylinder is estimated using regression equation Y on X. It is verified by testing Ho: b=0.

3] On the basis of this, estimated value of number of days corresponding to different categories has been suggested.

4] The overall decision of giving 12 cylinders on subsidy seems to be justifiable for family size up to 6.

5] However, family size 2 to 5 requires less numbers of cylinders than that given on subsidy. Whereas family size 7 and above requires more cylinders.

6] Therefore, to give justice the size of family is an important aspect.

Future scope of the work

1] This is pilot survey, now it can be extended on large scale.

2] On the basis of this study government can modify the subsidy policy on LPG.

3] With little administrative adjustment all family sizes can be justified with almost the same total number of cylinders given on subsidy.

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