

Chapter 5:

Concepts and Methodology

Concepts:

Productive Efficiency (Farrel, 1957): It can be studied under two sub-concepts:

- Technical efficiency (H. Speight, 1970): A productive unit or system is efficient if it can adequately meet the demands made on it. Or it is also defined as a unit or system that uses the least possible combination of inputs to produce the desired output.
- Factor price efficiency: It means a unit or system which uses the best possible combination of input using their relative prices.

The requirements of productive efficiency are:

1. Perfect planning of the managers responsible for production.
2. Adequate coordination of the complex operations.
3. Precise knowledge about the 'best' practises and prices.

Economic efficiency: An economic system or a productive unit is economically efficient if it has technical efficiency as well as it uses its resources and products in the most desirable way.

It depends upon:

- The scarce resources that are at the disposal of the firms.
- The scarce resources have alternative uses.

The phrase 'in the most desirable way' has a normative connotation. Thus, it can vary widely and sometimes may be contradictory to two or more units. For the society it means social welfare maximisation whereas for an individual firm it may mean profit maximisation, sales maximisation, growth rate maximisation, value maximisation or maximising sustainability.

Objectives and sub-objectives:

1. To rank 95 restaurants of Guwahati on the basis of their levels of efficiency.
 - To see if the results derived from different methods are different.
 - To find out if there exists any relationship between efficiency of a restaurant and the gender-based ownership.
 - To test the existence of the 'learning curve' phenomenon.
 - To see which of the considered inputs have a significant impact on the efficiency of the restaurants.
2. To understand the qualities of a restaurant that are desired by people from different socio-economic backgrounds.
 - To know the frequency of people's visit to restaurants.
 - To understand the expenditure incurred by the people on food from restaurants.
 - To analyse the mode of consumption of restaurant food among the people.

Operational definitions:

1. Restaurant: The National Restaurant Authority of India Report 2016 classified the organised fast food service industry into six formats, namely, quick service restaurants, casual dining restaurants, fine dining restaurants, cafes, frozen desserts and pubs, bars, clubs and lounges. This study will consider the first four categories as these provide food of all kinds and are not limited to specialised food like beverages and desserts.
2. For demand for fast food, this study will take into consideration those people who actually spend on the purchase of fast food at least once in a month.
3. Efficiency: For this study, by efficiency we mean technical efficiency as defined above.

Assumptions and considerations of this study:

1. All the restaurants want to grab as many customers as possible and they adjust their inputs accordingly.
2. All the selected restaurants were located right beside the main roads so that locational differences do not unduly affect the consumer turnouts.
3. The questionnaires were prepared in both English and Assamese language so as to make it more convenient for people.

Objective 1:

To rank the most popular restaurants on the basis of their level of efficiency.

Methodology for Objective 1:**Sample size:**

A similar study conducted in Israel in 2007 by Y. Hadad and others have taken 30 restaurants to measure their efficiencies. Another study by Hadad and others on 2005 took 52 hotels for studying their level of efficiency. Yet another study by Cook and others have taken 20 Japanese companies and 15 Fortune's top US cities to evaluate and rank the units in terms of efficiency.

As per the Statistical Year Book 2016, MOSPI, Govt. of India, the total number of cinemas, theatres, hotels and restaurants in Assam in the year 2013 was 4000 while according to the Economic Census of India 1990, there were 26718 hotel and restaurant establishments in Assam. So we take the bigger number and using the Yamane (1967) formula with 10% level of precision, we get the sample size of 99.62. And if we consider the population to be unknown and use the Cochran formula, we get the sample size of 96.04. So in this study we are taking a total of 100 restaurants.

Sampling:

Guwahati Municipal Corporation has divided the city into 6 zones, namely, central, east, south, west, Dispur and Lokhra with different number of wards in each zone. Restaurants would be selected from each zone and the number of restaurants in each zone would be in proportion to the number of wards they include. Therefore, the number of restaurants from each of the aforementioned zones would be respectively 13, 19, 13, 23, 19 and 13. The restaurants would be chosen randomly from the lists available on Zomato, Just Dial or similar websites. So the sampling procedure would be two-stage cluster sampling.

Type of Data and Collection:

Data would be primary data and it would be collected by personal interview method from the managers of the restaurants. A structured questionnaire would be used that would contain relevant questions on the revenue and various costs incurred by the restaurants so that their efficiency can be measured.

Analysis:

The collected data would be analysed using Data Envelopment Analysis (DEA). There are various methods under the umbrella term DEA, namely, CCR, BCC, super efficiency method, cross efficiency method, canonical correlation analysis, discriminant analysis of ratios and global efficiency method. However, all the methods are highly correlated and their correlation is significant with p-value less than 0.01 (Hadam et. al., 2007). Therefore, in this study, we calculate the efficiency of the restaurants using the CCR and BCC method and also by using another simpler method proposed by Muller.

To see the similarity or dissimilarity of results using the three methods, a correlation analysis is done. For this purpose, the Spearman's rank correlation technique is used as it is the most suitable in the current situation.

To study the relationship between gender-based ownership and the efficiency of the restaurant, the method of Binomial LOGIT is used. This method is suitable as the dependent variable, gender, has two categories, male and female. The category of transgender is not included under gender as there is very little chance of finding a restaurant owner who is a transgender.

The sub-objective of testing the 'learning curve' theory is done using SPSS where different models fitting tools are available.

The last objective of finding out the inputs that significantly affect the efficiency level, the Tobit model is used. It is suitable in this context as the dependent variable, efficiency, cannot take values beyond 0 and 1. Therefore, instead of the linear regression model, the Tobit model with censorship is more suitable.

Objective 2:

To understand the qualities of a restaurant that are desired by people from different socio-economic background.

Methodology:

Sample size:

The population of Guwahati city according to Census 2011 is 968643. However, the population below the age of 15 is not considered in the study as they do not fall in the work force and mostly dependent on someone else for their purchases. Therefore, the universe of this study is 726482.

Using Yamane's formula and Cochran's formula for sample size with 5% level of precision, we get the sample size of 400 and 383.95 respectively. Therefore, we choose 400 as the sample size. An additional 39 people (approximately 10% more) were surveyed so as to take care of outliers that may crop up later in the study.

Sampling:

The sampling procedure would be three-stage cluster sampling and the sampling units would be the customers of the restaurants identified for the first objective. A total of 4 customers from each restaurant would be selected randomly at different time points and on different week days.

Type of Data and Collection:

The data would be primary data and the mode of collection would be personal interview where the people would be asked about their socio-economic condition and about their preference for fast food and restaurants, following a structured questionnaire.

Analysis:

The collected data would be analysed using Multinomial Logit Model with characteristics of restaurants as the dependent variable and the socioeconomic condition of the people as the independent variables. This is done so as to understand the reasons of preference for restaurants by people of different socioeconomic background.

To see the effect of socio-economic background of a person on the frequency of visiting restaurants and the amount of expenditure incurred on restaurant food, the linear regression model is used using the software STATA.

The last sub-objective of the impact of socio-economic background on the preference of restaurant food over home-cooked meals is studied using the Multinomial LOGIT model because the dependent variable, preference, has been divided into three categories: prefer to have home-cooked meal, like going to restaurants and enjoying a meal there, and prefer to order food home from restaurants.