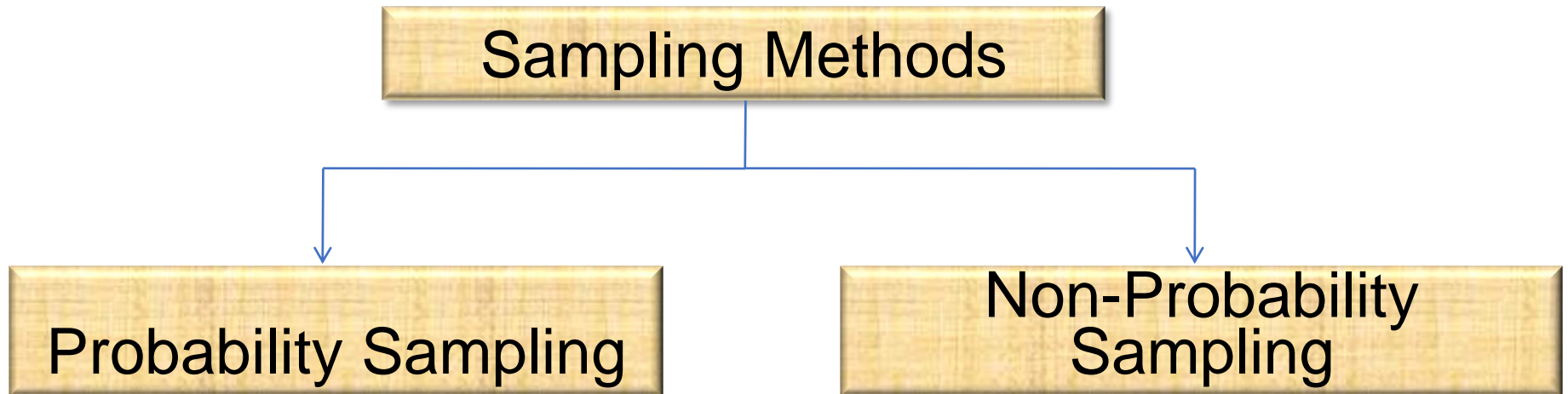# Non- Probability Sampling Methods

Course unit ECON 53115
MA/MSSc in Economics

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Methods of Sampling

A sample can be selected from a population in various ways. Different situation call for different methods of sampling. There are two methods of sampling:

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┌─────────────────────────┐
│    Sampling Methods     │
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    ┌──────┴──────┐
    ▼             ▼
┌──────────┐  ┌──────────┐
│Probability│  │Non-Probability│
│ Sampling │  │  Sampling │
└──────────┘  └──────────┘
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Random *or* Probability Sampling

Random or probability sampling is the scientific technique of drawing samples from the population according to some laws of chance in which each unit in the population has some definite pre-assigned probability of being selected in the sample. The main probability sampling methods are:

i. Simple Random Sampling

ii. Stratified Random Sampling

iii. Cluster Sampling

iv. Systematic Sampling

Non-Random *or* Non-Probability Sampling

The methods that sampling units being selected on the basis of personal judgment is called non-probability sampling. In this method, personal knowledge and opinion are used to identify the individuals/items from the population.

It does not involve probability of selection.

The population may not be well defined.

There are several non-probability sampling methods. Followings are the mostly used methods:
- Convenience Sampling
- Purposive/Judgment Sampling
- Snowball Sampling
- Quota Sampling

Advantages of Probability Sampling

- It gives a representative sample even if the population is heterogeneous.

- Statistical measures (parameters) can be estimated and evaluated by sample statistic in terms of certain degree of precision.

- Since the estimates are unbiased, they can be generalized to the population.

- It is used to draw statistical inferences.

- Mathematical statistics and probability can be applied to analyze and interpret the data

Disadvantages of Probability Sampling

- Cost of sampling in terms of money and time is high compared to the non-probability sampling.

- Non-response error is high.

- When sampling frame is not sufficient, complete and up-to-date, the sample does not reveal the real situation.

Advantages of Non-probability Sampling

- Results can be taken within less time period. Thus, this technique is most popular in market researches.

- Non-response error does not arise.

- Cost is less than to the probability sampling

- Scientific knowledge is not required.

- Visiting a sample of business establishments that are close to the data collection organization.

- Seeking the participation of individuals visiting a web site to participate in a survey

  eg. Facebook, LinkedIn, Google+ etc.

Popular in
Opinion surveys

- A survey on the service of a bank,

- Perception over the service of a government institution

- Opinion over an election result

- Job satisfaction etc.

Market researches

- Consumers' views over the quality of a product

- Market accessibility and feasibility

For case studies

Data Collection?

Do not advocate to use in researches for policymaking!!!

Advantages

In addition to the overall advantages,

- Easiest method, compared to other sampling methods hence the research become easier

- Helpful for pilot studies and for hypothesis generation

- Data collection can be facilitated in short duration of time

- Cheapest to implement than alternative sampling methods

- Non-response error does not arise

- Proper sampling frame is not needed

Disadvantages?

- Highly vulnerable to selection bias and influences beyond the control of the researcher,

- High level of sampling error,

- Inability to generalize research findings,

Results of the studies that use convenience sampling have little credibility due to reasons above.

Snowball Sampling

A nonprobability sampling method

This method is useful when the population is hidden or cannot trace clearly due to the various reasons including legal and ethical matters.

The only way of finding members of some communities is by asking other members.

e.g.

- Heroin addicted.
- AIDS patients
- About an undisclosed group/organization
- Prostitution

The first step of this method is to find one member in the given population by any method.

This step is known as first round.

Next, ask first round member about any others. This list form the second round.

Next, ask each of the second round members about any others.

This process is repeated number of rounds and stop when they give the same names over and over again.

In each round the percentage of new names entering into the name list can be calculated.

This percentage is high in the first rounds and then will drop sharply.

When the percentage of new entrants drops to around 10 percent, then the process stops.

This will be the sampling frame. From this list a sample can be drawn randomly.

Snowball sampling works well when,

- No population list is available;

- Members of the population knows each other

- Easiest way to produce a list close to the whole population

Disadvantages

- Requires a lot of works when the population is large;

- Isolated people will not be included in the study

Purposive/Judgment sampling

A nonprobability sampling method

Sample units select purposely based on a logical manner but not randomly .

Objective of taking purposive sample is to produce a sample that can be logically assumed to be representative of the population.

This is achieved by applying expert knowledge over the population to select a representative sample in non-random manner.

Elements selected for the sample are chosen by the judgment of the researcher.

Researchers often believe that they can obtain a representative sample by using a sound judgment, which will result in saving time and money.

TV reporters stopping certain individuals on the street in order to ask their opinions about certain political changes constitutes.

However, the TV reporter has to apply certain judgment when deciding who to stop on the street to ask questions; otherwise it would be the case of random sampling technique.

Selection of a sample of universities in Sri Lanka that represent a cross-section of Sri Lankan Universities.

- This required expert knowledge of the population.

- The characteristics which are important to be represented the sample. e.g. large, medium and small universities, Public and private universities.

- Identification of sample units which meet the various characteristics that are viewed as being most important.

eg. 3

Selecting resources persons for TV program to discuss:

- New tax policy of the government

- The measures taken to ease the pressure on Sri Lankan rupee.

- Sri Lanka – Singapore trade agreement

- Attainment of Good governance government over past three years

eg. 4

This method is effective when only limited numbers of people can serve as primary data sources due to the nature of research design and aims and objectives.

- For a research analyzing affects of personal tragedy such as family death on performance of senior level managers.

The researcher may use his/her own judgment in order to choose senior level managers who could participate in in-depth interviews.

- Experience of the farmers who cultivate a certain special crop

- Experience of the persons who use a specific type of motor vehicle

Data collection: In depth interviews

Advantages

- Purposive sampling is one of the most cost-effective and time-effective sampling methods available

- Purposive sampling may be the only appropriate method available if there are only limited number of primary data sources who can contribute to the study

- Can take a representative sample in non-random manner if the researcher has sufficient knowledge over the population.

Disadvantages

- Vulnerability to errors in judgment by researcher

- Low level of reliability and high levels of bias.

- Inability to generalize research findings

Quota sampling

Quota sampling is a type of non-probability sampling technique.

First, the population is divided into strata or identify the different groups of the population.

Mostly, Gender, profession, age, social condition etc. are taken as stratification factors.

Second, decide the sample size

Third, calculating a quota for each stratum: quota means the number of cases that should be included in each stratum.

It depends on the make-up of each stratum within the population. e.g. male and female are 50-50 or 60-40 etc.
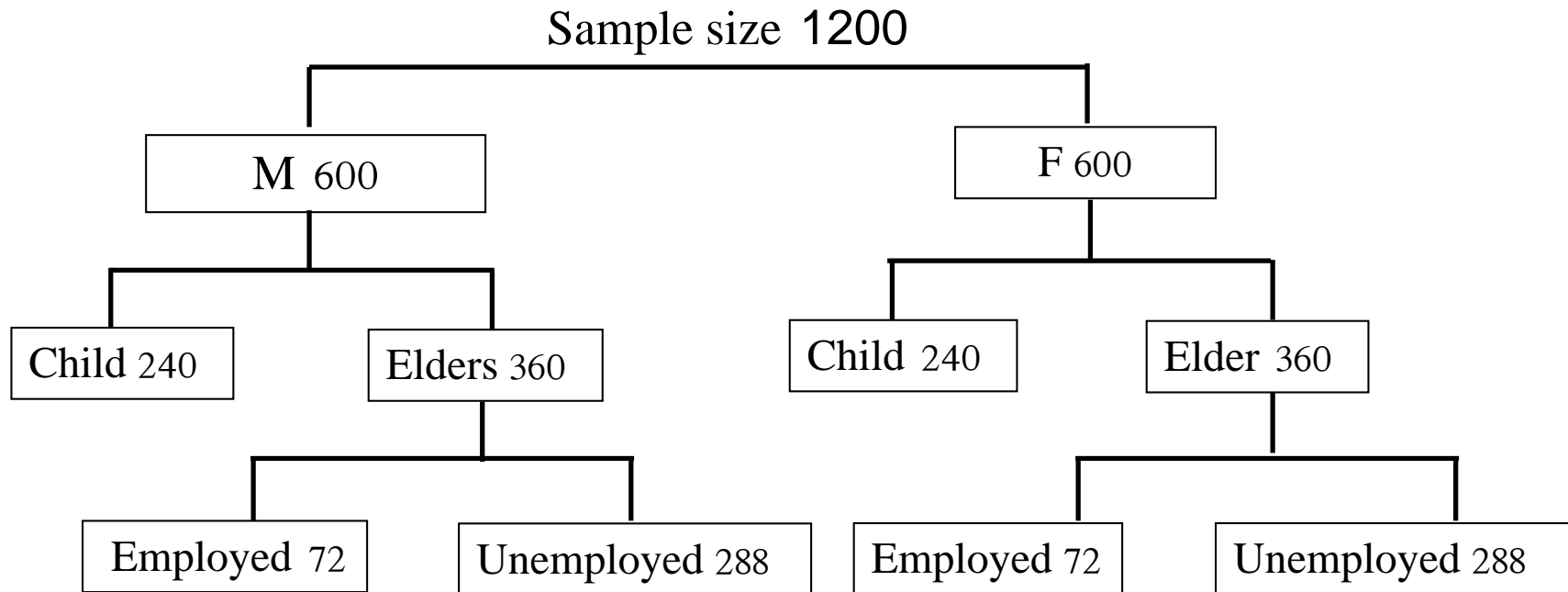
Fourth, Continue to invite cases until the quota for each stratum is met

Once you have decided the number of cases you need in each stratum, you simply need to keep inviting participants to take part in your research until each of these quotas are filled.

For example, suppose that you are interested in comparing the differences in career goals between male and female students of the university of Kelaniya.

- Population: number of students say, 10 000.

- Stratification factor: Gender

- Proportional number of male and female students relative to the population: 2:3

- Sample: 100

- Sample should include 40 male students and 60 female students.

Suppose that an advertising firm needs to explore the views of different segments of people over its new TV advertisement. It planned to survey 1200 people based on the quota sampling method and sample should represent different segments of people as follows: Male and femal 1:1; Children and elders 2:3 and employed and unemployed elders 1:4. Make the quota control plan.

Sample size 1200

M 600

F 600

Child 240

Elders 360

Child 240

Elder 360

Employed 72

Unemployed 288

Employed 72

Unemployed 288

Advantageous of Quota Sampling

- Quota sampling is particularly useful when researchers are unable to obtain a probability sample, but still trying to create a sample that is as representative as possible of the population being studied. In this respect, it is the non-probability based equivalent to the stratified random sample.

- The use of a quota sample, which leads to the stratification of a sample (e.g., male and female students), allows us to more easily compare these groups (strata).

- The quota sample improves the representation of particular strata (groups) employed within the population, as well as ensuring that these strata are not over-represented.

- Quota sampling is much quicker and easier to carry out because it does not require a sampling frame and the strict use of random sampling techniques.

Disadvantages of Quota Sampling

In quota sampling, the sample has not been chosen using random selection, which makes it impossible to determine the possible sampling error.

It is not possible to make statistical inferences from the sample to the population.

This can lead to problems of generalization.